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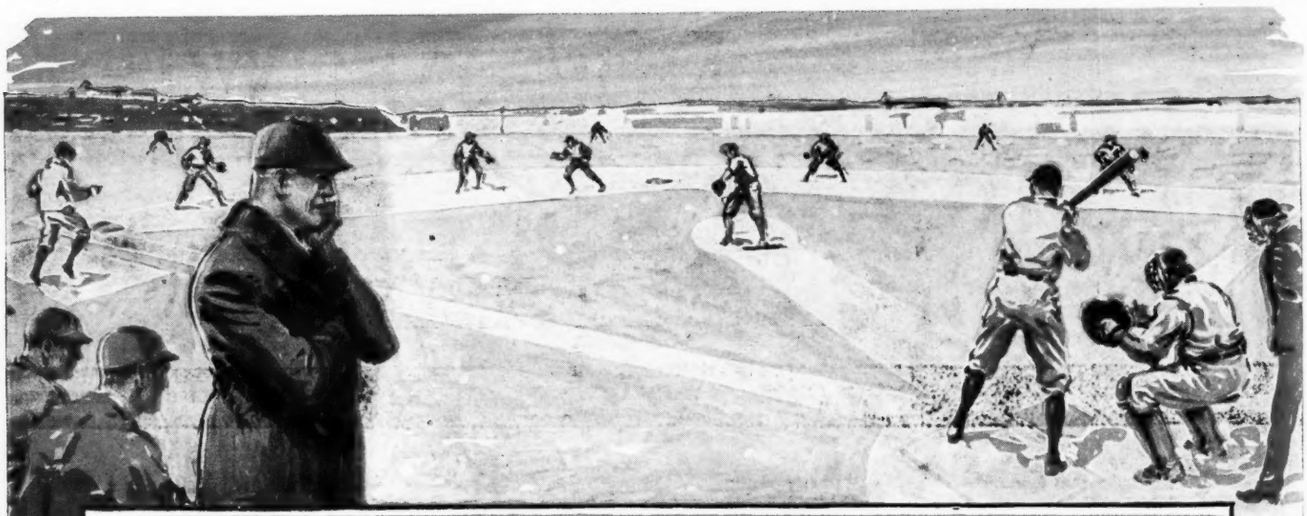

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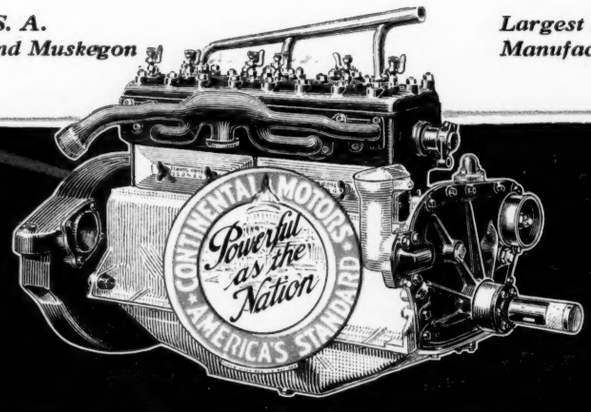

Continental Motors

AUTOMOTIVE INDUSTRIES
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VOL. XLVI. NEW YORK—THURSDAY, FEBRUARY 2, 1922 No. 5

Farmers Are Eager to Buy Motor Trucks

Delegates to agricultural conference almost unanimous in regarding truck as economic necessity. Farmer will be back in market by August, 1922. Some sections are already financially recovered.

By James C. Dalton

WASHINGTON, Jan. 28.—Motor truck manufacturers who study, analyze and develop farm markets will be the ones who will reap the rewards in the near future.

This fact was evidenced indisputably by interviews with delegates from all sections of the country who attended the national agricultural conference which closed its sessions here last night. They believe the development of the truck will be fully as spectacular as that of the passenger car. They regard it as an economic necessity in the expansion of the co-operative marketing movement, which is one of the biggest things on the agricultural agenda at this time.

One after another representatives of big agricultural organizations declared the market for trucks has scarcely been scratched. Not only that, but they believe the farmer will begin to come back into the market in August or September. In some sections sales can be made even now and the demand will expand as the year advances. The number of sales this year will not be startling, but it promises to be greater than truck makers have expected.

The automotive industry seems to have taken it for granted for the past year that the agricultural districts are absolutely dead as markets at this time, but such is not the case if the delegates to the conference know what they are talking about and, if they didn't, they wouldn't have been invited to attend.

After "blue Monday," when all the pent-up grief of the agricultural industry was spilled at the opening sessions of the conference, the lobbies and grand ballroom of the Willard, where the convention has been held, have not been shrouded in gloom. As a matter of fact, the optimism of a majority of the delegates is rather surprising.

Except in the great grain-growing states and in the cotton belt, the farmers are not so badly off. Many of them are making some money and few are bankrupt. They have serious problems to face and have heavy debts to pay, but they are coming back.

All the delegates interviewed were asked the specific question, "When do you think farmers in your section will be back in the market for motor trucks?"

Almost without exception the reply was, "In the late summer or early fall."

Some of the delegates declared trucks are being sold now on a small scale. Districts in the South, which have diversified crops and which have not shared in the depression which has hit the cotton growers, are markets even to-day for the real automotive merchandiser.

This conference probably was the most representative of its kind ever held in this country. Every

branch of agriculture was represented by its leaders. Not all the delegates were real "dirt farmers," but a majority of them were. They could speak with authority for their neighbors. They knew what the farmers were thinking and what they intend to do.

The delegates were interested in all the problems which confront the farmer, but they all took it for granted that co-operative marketing on a gigantic scale is one of the assured developments of the future. This movement, which has been brought to a head partly by high freight rates and partly by discontent because of the wide margin between what the farmer gets for his products and what the consumer pays for them, already is well under way.

Future developments, however, will be on a vastly more ambitious scale. They will be engineered in large measure by the American Farm Bureau Federation, which is the real power behind organized agriculture. Its whole marketing program is based on co-operative effort. The real foundation for it is the motor truck. If the farmer were still dependent upon the horse-hauled vehicle he could not put it over, because distances would be too great and he would still be dependent upon the railroad.

But the farmer, aided by the motor truck, has tested his power and is eager to test it still further. He knows that for distances up to 150 miles the truck can do the work. He now can reach directly markets more remote than he dreamed of reaching a few years ago. The expansion of direct marketing has come with the "hard road," and its development means a rapid and nation-wide development of good roads.

One man from Minnesota was asked if he thought the use of the truck would be greatly expanded in his state.

"For what other reason do you think we are going to build 7000 miles of good roads?" he replied.

That answer was typical of the thought of the leaders of farm opinion from every section.

A man from Texas made this equally significant statement:

"We thought for a while that we'd tax the trucks off the roads, but we've changed our minds."

To determine just what representative farmers from every section of the country think of motor trucks and the potential market for them, the representative of AUTOMOTIVE INDUSTRIES at the convention buttonholed delegates at random and put the question up to them. No attempt was made to talk with the "outstanding figures" at the conference. In fact, quite the reverse was true, for the views of real "dirt" farmers were sought. Here are the opinions of some of those interviewed:

HUBERT F. BAKER, Michigan Potato Growers' Exchange.—"Within five years 75 per cent of the farmers in northern Michigan will be using motor trucks. They are beginning to realize that they must have them if they are to market their products successfully. I believe there is a wonderful future for motor trucks on the farms. Farmers in our section are buying them as fast as they can, and if everything goes well I expect many more to be in the market by next fall. My own experience has convinced me that trucks are indispensable for potato growers."

O. G. SMITH, President, National Farmers' Congress, and President of the Nebraska Good Roads Association.—"The hog growers in our section are using many motor trucks and many more will be placed in use as soon as funds are available to buy them. We are thoroughly sold on the motor truck and it must be used if co-operative marketing is to be successful. I believe that northern Nebraska will be back in the market in the fall for motor trucks if the price of hogs stays where it is now. The use of trucks provides a wider and better market and tends to make friends of consumers."

HENRY C. STUART, formerly Governor of Virginia, President, State Farm Bureau.—"The farmers of Virginia are sold on the motor truck. In fact, they are oversold just at present, but they will be back in the market as soon as they can get a little money. High railroad freight rates make co-operative marketing necessary and motor trucks are essential to co-operative operations by farmers. By the use of them a few farmers can get together and market their products more profitably than they can hope to do in any other way."

C. V. TOPPING, Southwestern Millers' League.—"I believe that farmers in the territory covered by our league, which includes Kansas, Nebraska, Colorado, Texas, Oklahoma and Missouri, will be back in the market for trucks in the fall. The farmer who has owned and operated a truck is the best possible advertisement for a motor vehicle because nearly all of them have found them efficient and economical. Jobbers in our section are using them exclusively for hauls up to 150 miles. This work is particularly profitable because a system has been worked out which provides return loads."

W. B. HUNTER, President, Georgia Fruit Growers' Exchange.—"I believe the demand for motor trucks has not really started and, although they already are widely used in Georgia, they are not yet operated to anything like the extent they will be when funds are a little more plentiful. They are particularly valuable in marketing fruit crops which require prompt transportation. The service question is the most important of all for us, and automobile manufacturers must be made to realize that service is more important than the vehicle itself. We cannot buy certain makes of motor vehicles because the service for them is so unsatisfactory."

C. A. COBB, Editor, *Southern Ruralist*, Atlanta, Ga.—"The South is about a year ahead of the rest of the country on the way back to prosperity. We were practically broke a year ago, but we have already begun to go upgrade. Credit is much easier and there will be enough for legitimate needs. Some of our people have a little money to spend and I believe there is a great future for motor vehicles in the South."

G. M. PUTNAM, President, New Hampshire Farm Bureau Federation.—"When a farmer has to go six or eight miles or more to his market I believe a half-ton or a ton truck is essential to profitable operation of his farm. Many more of these vehicles will be sold in New Hampshire."

CHARLES L. HILL of Wisconsin, largest importer in the United States of blooded stock.—"We've just got to have motor trucks. Mine is the best investment I ever made. The demand for them is bound to grow. I believe some of them could be sold now, but not many. The farmers in our State are not by any means down and out financially. Most of the extreme pessimism comes from the grain-growing states. Other states are not so badly off."

W. M. BURLINGAME, American Society of Equity, a farmers' life and fire insurance organization, Great Falls, Mont.—"Conditions in Montana are not so bad as they might be, and I believe the farmers in our section will be back in the market for motor trucks in the fall or even earlier. Others will buy as soon as they can get the cash. There is no question of the ultimate demand."

O. F. E. WINBERG, President of the Gulf Coast Citrus Exchange, Mobile, Ala.—"There is a good market for trucks in our section right now, for the farmers down there don't realize that times are hard. They have a diversity of crops, and trucks are being used more and

more extensively. The use of trucks will expand with the development of good roads and we are going to build them."

C. H. MACDOWELL of Chicago, President of the National Fertilizer Association.—"The use of motor trucks will develop parallel with the building of hard roads. There's where the economy in their use is manifested."

CARL WILLIAMS, Editor of the *Oklahoma Farmer-Stockman*.—"Farmers in our section will begin to come back into the market for trucks after the wheat crop is harvested in June. This business will be nothing tremendous, but at the same time there will be a fairly good demand. Sales of motor trucks in our section are just in their infancy."

GEORGE B. TERRELL, Texas State Commissioner of Agriculture.—"Trucks are here to stay. Our farmers will buy when they get the cash. The volume of sales this year all depends on the cotton crop. There has been a strong reaction in our State against the movement to tax motor trucks off the roads. We have changed our minds on this subject, although we still believe trucks should bear a fair share of the burdens of taxation in maintaining and building highways."

H. B. NICKERSON, President of the Minnesota Co-operative Creameries Association, Inc.—"There are in our State 600 co-operative creameries which make 100,000,000 lb. of butter a year. By far the largest part of this product is handled by truck. We are building in Minnesota 7000 miles of improved roads and it is all because of trucks. Why else do you think we would spend all that money? We're going to put $10,000,000 a year into good roads. The market for trucks in our State hasn't been touched. Co-operative marketing will open a big field for them. Freight rates are too high and the economic value of the truck has been demonstrated."

T. C. ATKESON, Washington Representative of the National Grange.—"Use of the motor truck is an economic question. If the farmer can reduce expenses and lower his costs by the use of a truck he is justified in borrowing money to buy one, for it is a good investment. It certainly has been demonstrated that marketing costs are reduced by the use of trucks when the farmer is any distance from his market."

C. V. GREGORY of Chicago, Editor of the *Prairie Farmer*.—"A survey of the State of Illinois shows that farmers are turning more and more to the use of motor trucks as a means to expedite the delivery of farm products and reducing transportation costs. Large grain elevators at Stronghurst, Ill., report 95 per cent deliveries by motor trucks. The tremendous increase in the use of trucks for hauling farm products to the grain elevator owners made it necessary to construct special dumps for trucks. Hauling live stock in motor trucks across the State instead of using freight cars is becoming more and more the rule. Conditions of the farmers are slowly improving and eventually they will be on the market as large purchasers of motor vehicles and tractors."

R. R. WALKER of Dallas, Texas, Agricultural Agent of the Missouri, Kansas & Texas Railway.—"The motor truck and tractor are fixtures on Texas farms and are becoming just as essential to the farmer as binders or gang plows. I am convinced that the motor truck will, within a few years, replace all other means of transportation from farm to market, with the exception, of course, of railroads. In Texas the good road movement is encouraged by railroads because it brings more farm products to their terminals for long-distance hauling."

The need for the proper servicing of trucks is in the back of the head of every farmer who owns one. They do not complain bitterly of the situation as do their city cousins, but that is one factor which must be given serious and scientific consideration by the manufacturer who expects to develop a permanent farm demand for his products. The farmer will buy the truck which has the best service facilities in his district, even though he may like another make better.

Service is particularly important for those farmer merchants who have perishable products, such as fruit, to handle. The extent to which trucks are used in the fruit industry is really remarkable, but lack of proper service in this field has aroused some criticism. One big peach grower said that when he started his crop to the railroad by truck he always kept teams in reserve to take over the load if a truck broke down.

ALL the delegates interviewed at the national agricultural conference were asked this question by the representatives of AUTOMOTIVE INDUSTRIES:

"When do you think the farmers in your section will be back in the market for motor trucks?"

Almost without exception the answer was, "In the late summer or early fall."

While the farmer asserts positively that the railroads have lost the short-haul business permanently, he is not enthusiastic over heavy-duty vehicles. It seems to be the almost unanimous opinion that half-ton and 1-ton trucks are the best for all-round farm purposes. This preference may continue, even with the expansion of co-operative marketing, because it is felt that heavier vehicles wear out the roads too fast without compensating advantages.

Another thing which rankles more or less in the minds of the farmers is that their individual needs have not been considered carefully enough by the dealer from whom they bought their truck. They feel that the dealer was more interested in selling them the vehicle on which his commission was largest than in considering what was best suited to the purchaser's needs.

Taking these points into consideration, it is evident that the truck maker and dealer who studies the farm problem and the subject of operating costs most carefully will be the one who will make the most sales.

One point which the farmer has not overlooked and which has strengthened the position of the automotive manufacturer, both passenger car and truck, is that the prices of their product have been reduced to pre-war or approximately pre-war levels. The farmer feels that it is one industry which has been "liquidated" almost as thoroughly as he has and that he is getting the benefit. On this score at least he does not feel so friendly toward the farm implement manufacturer.

Apart from the opportunity it afforded of determining the view of the farmer on the essentiality of the motor truck in agricultural operations, the conference was important from the viewpoint of the industry. The intimate relationship between agriculture and the automotive industry was recognized by Secretary Wallace when he selected the delegates.

Roy D. Chapin, Windsor T. White, C. C. Hanch and Harvey S. Firestone represented the industry in the committee conferences, chiefly in an advisory capacity. The taxation views of Hanch were presented to the committee on taxation and those of Chapin to the committee on highway transportation. White and Firestone also

gave the benefit of their experience to the committee on transportation, which was divided into sub-committees on highways, rail and waterways. The developments of the conference most important to the industry in this respect were:

Adoption of a strong resolution demanding more extensive development of good roads which will permit "orderly marketing."

Adoption of a resolution calling for the appointment of a private organization to co-ordinate transportation, thus evidencing the crystallization of farm thought in this direction. This resolution was offered from the floor.

Adoption of a resolution insistently demanding the prompt reduction of freight rates. Adoption of a resolution positively and earnestly protesting "against any consumption or sales or manufacturers' tax or any other tax which shifts the burden onto those least able to pay and has proved disappointing financially and socially unjust wherever tried." This applies directly to the obnoxious excise taxes now imposed on the sale of motor vehicles.

The text of the highway resolution follows:

"County highways are the farmers' first and principal transportation means of marketing their products. They are the arteries of the economic and social system of the country. On their condition rests the amount of the transportation charge that must be added to the gross cost of farm product and the more fully they are developed the less that weather conditions and soil are allowed to clog the flow of traffic, the greater will be the health of the body politic and the added profusion of enjoyments and privileges to the people.

"The loss from bad roads should be reduced to a minimum, not only to enlarge the farmer's market but to shorten the time and reduce the spread of price between the farmer and the consumer.

"The farmer ought to be able to haul to market twice as much twice as often as he has been able to do in the past. If the farmer is to be put in a position to help influence the price of his products by not dumping them on the market for fear of unseasonable weather, he must control the condition of the roads to his markets. Without proper road conditions "orderly marketing" can never be accomplished. Rapid growth of traffic over the highways has been so greatly intensified during the past few years that this method of transportation needs earnest and careful consideration. To this end,

"We urge the closest co-ordination between the three major forms of transportation, so that railways, waterways and highways may each carry the kind of traffic that it can the most economically, expeditiously and efficiently serve.

"We commend the Department of Agriculture, State Highway Departments and colleges for their research in connection with highway construction, maintenance and transport over the highways and urge full support be given these investigations.

"We approve the action of Congress in continuing Federal Aid for the building of interstate, postal and farm-to-market highways under the Department of Agriculture and making appropriation therefor. We believe this policy to be equitable and constructive. We urge Congress to continue this policy for a definite period, so that the States may plan adequate co-operation.

"We call particular attention of Federal and State authorities to the growing necessity for regulation of traffic on highways, in order that they may be protected from excessive and destructive abuse. Research into causes of highway wear should be continued by the Department of Agriculture and State Highway Departments and traffic regulated according to the facts developed.

"It is self-evident that farm products are the most cheaply transported over well-kept highways. We, therefore, urge that all possible safeguards should be placed about the maintenance of highways.

"Safety of life and limb on the highways is paramount and we favor every effort to make the use of streets and highways less dangerous to all citizens.

"We commend the Department of Agriculture for its policy in highway improvement, of providing roads suitable for horse-drawn as well as motorized vehicles and urge that wherever practicable side roads be constructed adjacent to the metal surfaced portion of the highway.

"Rapidly changing traffic conditions on our thoroughfares make the construction and maintenance of our highways an important engineering and business undertaking, therefore, all partisan or political consideration must be eliminated."

When asked what, in his opinion, was the most important result of the conference from the point of view of the automotive industry, Chapin said:

"The farmers have accepted the idea that highway transport must be developed for the benefit of the agricultural districts. This cannot fail to expand the market both for trucks and passenger cars."

THE American Farm Bureau Federation is the real power behind organized agriculture. Its whole marketing program is based on co-operative effort. The real foundation for it is the motor truck. If the farmer were still dependent upon the horse-hauled vehicle he could not put it over, because the distances would be too great and he would still be entirely dependent upon the railroad.

Another resolution of interest to the industry, offered from the floor of the convention and adopted with virtual unanimity, was a recommendation that Congress accept the offer of Henry Ford to take over the Muscle Shoals project. It was felt Ford would make good on his offer to provide cheaper fertilizer. It was significant that the principal opposition came from the fertilizer interests. This resolution was offered almost simultaneously with the announcement that Ford had reduced the price of his tractor from $625 to $395.

It was generally conceded that the conference was a success and that its recommendations will lead to tangible results. Many of the suggestions made by President Harding in his opening address were indorsed and this will tend to make him, willingly or unwillingly, the sponsor for some of the legislation which probably will be framed by members of the "agricultural bloc" in Congress.

Another rather incongruous development was that while Attorney General Daugherty is inclined to think that the gathering of production statistics and kindred data by trade associations is a violation of the Sherman anti-trust law, a committee of the conference called upon Congress to provide funds which will permit the Department of Agriculture to collect information of every conceivable kind bearing upon production and marketing.

Farmers want this information, not only from every county in the United States but from every country in the world, and they want agricultural attachés upon the staff of every embassy. This program is indorsed by Secretary Wallace and there is nothing as yet to indicate that his efforts in this direction will meet the obstacles which have confronted Secretary of Commerce Hoover in collecting data along almost identical lines. The farmers even want this information sent to them by wire and radio.

Chicago Show Indicates Return to Stability

The price shower at the New York Show cleared the air. Cars are being merchandised at Chicago exhibit. Columbia, Moon, Hudson, and Nash show new models. Utility closed car prominent. Training of salesman brings excellent results. Manufacturers are releasing orders for parts.

By J. Edward Schipper

CHICAGO, Jan. 30.

THE eyes of the automobile industry are on Chicago and the twenty-second annual National Automobile Show. Never have they been focussed here more closely, for there is a keen appreciation that what transpires in the Windy City this week is fraught with importance. The Chicago show is always the real index of at least the first six months of the year, but this year it is more truly a barometer than ever.

Vision was so obscured by the price shower which took place in New York this year that one left a little more bewildered than before. But that shower was necessary to clear the air. The general feeling is now abroad that we have come down to brass tacks and that the Chicago show marks the beginning of a new era in the business.

There has been considerable comment on the fact that prices were talked too much at the New York Show. But, how could it have been helped? At Chicago it is different. Not only are the price cuts out of the way, but the plan of the Chicago dealers to omit price talk and to concentrate on the merit points of the cars themselves has served to create an entirely new atmosphere which is going to make itself felt in a greater volume of actual business at the show.

Factory executives have arrived early and are going to stay most of the week. The realization is abroad that the battle of this industry is going to be fought out on the firing line of the retail salesroom during the coming year. The result of this is closer scanning of the retail sales and service methods by the factories. This show is performing a valuable work in establishing new contact points.

All of this has provided a foundation for some real development work along certain well defined lines. This is very apparent from what new developments we find at Chicago as well as in the new features at New York. Probably the two outstanding developments are the utility closed car and the thousand-dollar six. It is very easy to see in the light of the present frame of mind of both public and industry a reason for both.

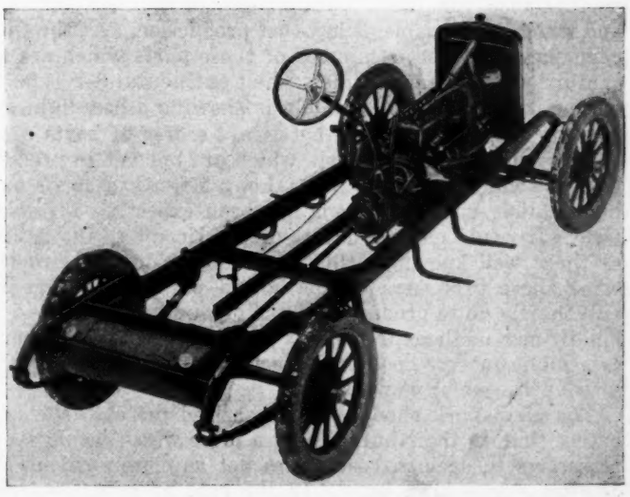
At this show the new Columbia is being shown privately to dealers. This is priced at $985 and incorporates Timken axles and the new Continental light six 6-Y line. This same engine is found in the new Moon shown at the Coliseum and the new Davis in the Armory. In fact Moon has engine No. 1, Columbia No. 2 and Davis No. 3 of this series.

The utility type of closed car which was conceded to be one of the interesting developments disclosed at New York is augmented by two new recruits here. These are the new Hudson coach, built along lines similar to those of the Essex coach, and selling for but $50 more than the seven-passenger phaeton, and the Nash cariole for $305 more than the touring car.

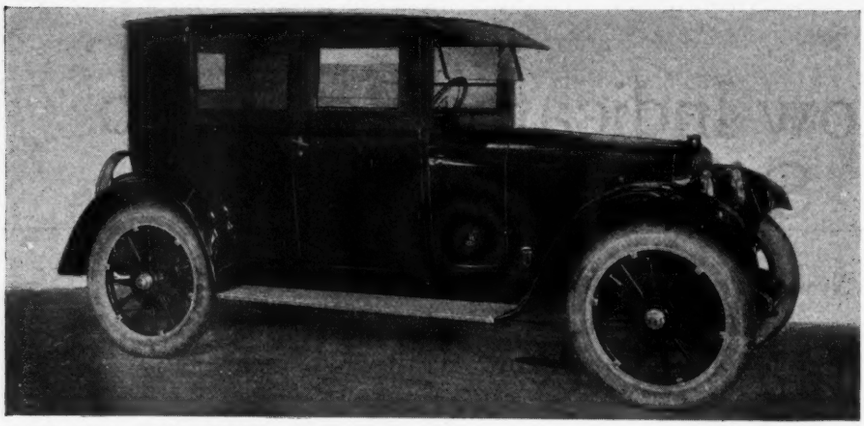
Real credit for the movement to dignify both the show and the industry in the eyes of the public must be given the Chicago Auto Trade Association. The night before the show opened this organization held its annual dinner and at that time completed its plans in the campaign to properly train dealers and salesmen for a proper presentation of the industry to the public at the show. More than 1000 dealers were present and they were addressed by George Graham, vice-president of Chandler, who impressed upon his hearers the necessity of maintaining the high standing of the industry upon which they depended for their living.

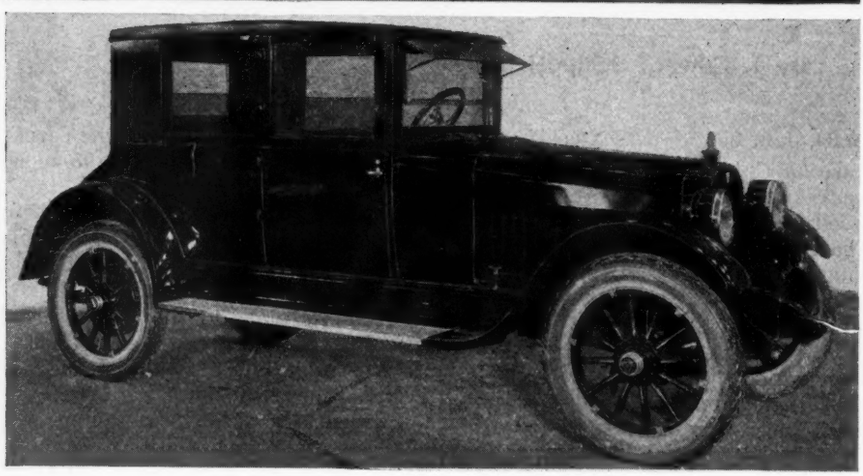
Already this salesman training is bearing fruit and there is a markedly more happy attitude at the Coliseum than there was at the Palace. Furthermore, there are few replies of "I don't know" to questions of price, and the entire situation is much more clean-cut. There is better salesmanship and more sales right off the floor are resulting. One make, for example, of which seventeen cars were sold off the floor during the New York Show, had two actual sales to its credit and four in immediate prospect before the show was 4 hr. old. This is a $2,500 car.

Members of the industry, other than the car manufacturer, are vitally interested in this show. The parts makers are here in large numbers. One of the most



Chassis of the new Columbia





Above—The Nash Carriole. Below—The New Hudson Coach

significant developments of the show is the effort of the assembled car maker to get down into a lower price field than has been possible during the past few years. It is quite evident that there will be a move of further standardization on the part of the parts manufacturers in order to increase production of particular parts models and meet the necessity for getting down in the price scale to where the assembler can put the car together and sell it on a competitive basis with the maker of the complete vehicle.

The $1,000 six is a good example of this and it is not surprising to note almost the same list of parts in cars which are assembled to sell at this price figure. This has called for the design of parts which give the required performance for these light-weight economical vehicles, and which are capable of low-cost production. At the Chicago show there are a number of these parts which are on exhibition for the first time. The Continental 6-Y type of engine is an example. Weidely is showing a new light six passenger engine. At the hotels are scores of parts companies with exhibits of parts which are not yet in production but which are ready now. Long Mfg. Co. has its new plate clutch which the trade has been expecting for some time. It would mean a listing of practically all the names of those well known in this phase of the business to tell what these producers of specialized parts have done or will shortly do to produce satisfactory units of new design and by new methods to make it possible to give the American public just as good or in fact, a better vehicle, at the lower price which now exists.

The New York show over-emphasized price to such an extent that, in their hurry to fix a price which would seem attractive to dealers, costs were not as closely calculated as they might have been. In the case of assembled car makers there are a few instances where the price on certain units was estimated too low. The result is that there may be a tendency among assemblers to shade upwards again when production is actually started. This condition, though, is much more the exception than the rule.

A lesson which the engineer and factory executive can take home with him is the marked interest of the public in economy of operation. Stroll about the booths and listen to the questions that the average man in the street asks the salesman and you will hear him ask, "How many miles to the gallon of gasoline?" or, "How many miles to the gallon of oil?" Almost invariably these questions are brought up in discussing cars up to and even over the $2,000 mark.

A large dealer attendance was manifest even the first day, and trains Sunday and Monday are bringing them in by hundreds from all over the country. Large delegations are here from the West as far as the coast, and it is quite natural that the manner of handling the public at this show will have a beneficial effect on the way the smaller shows are conducted.

What business will be done during the week remains to be seen. The stage has been set, however, and all indications are that this show is going to do more to clear the atmosphere than anything else that could have been planned. It is thought that the eliminating of the price bug-a-boo will in a large measure solve the used car problem.

The show has its by-products and one of these is very happily significant. It is to be found in the inner, innermost whispers of those who are in the heart of the business. Whispered news of larger releases during the past week than at any time since the dread fall of 1920 are in the air. These are all the more striking because they are not only from the passenger car field but the truck field as well. One large bearing manufacturer has just received the "go ahead" on a truck bearing order of large size, and this means truck production which affects all other makers in the truck parts business. Purchasing agents are placing orders now over a longer delivery period than for many a long month and nothing could indicate more closely than this something of a return of confidence in price stability.

Following are brief descriptions of the new models which made their first appearance at the Chicago show:

New Columbia Six

The new Columbia Six is being shown at the LaSalle Hotel, the exhibition being intended for dealers only, as the car will not be in production before April 1. Besides the low price, $985, this car makes its appeal through its connection with the name of prominent parts manufacturers from whose products the car is assembled and its tasteful body lines. It incorporates the new Continental 6-Y engine, which is claimed to develop 50.7 hp. on the block. The axles are Timken and the other parts manufacturers interested are equally prominent but may not at this time be mentioned. The clutch is a disk unit, the gearset a three-speed selected, the tires 31 x 4.

The sample body which is shown at the LaSalle is an Erdman-Guider product and is an excellent sample of the

(*Continued on page* 238)

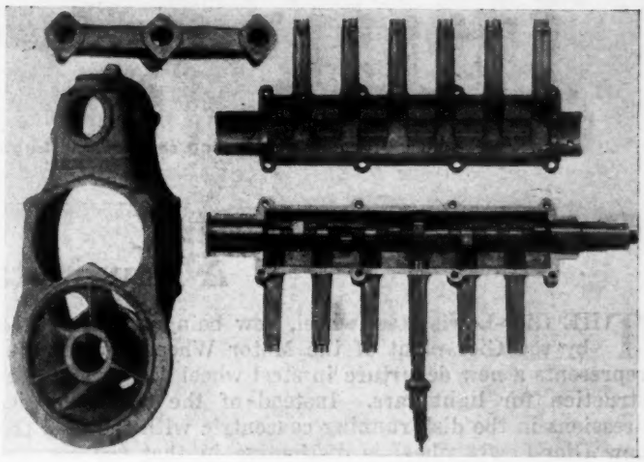
New Air-Cooled Car Has Twin-Three Engine

Detroit air-cooled car has 115 in. wheelbase and weighs 1700 lb. Twin-three six-cylinder engine used. 30 miles to gallon claimed. Crankcase is diecast and weighs 14 lb. Service and emergency brakes are interchangeable. Camshaft in separate housing between cylinder blocks.

A NEW air-cooled car was shown at the Detroit Automobile Show for the first time. In view of the fact that the car has been brought out by W. J. Doughty, who has been for many years a distributor of air-cooled cars, it is claimed that some of the features which have been installed on the new product are the direct result of experience with the servicing of air-cooled products.

Some unusual claims are being made for the car, which, although it has 115 in. wheelbase, is claimed to weigh but 1700 lb. It has a six-cylinder engine rated at 32 hp., for which a consumption of 30 miles to the gallon is claimed in ordinary driving. The price of the car is set at $1,250. Economy is claimed to result from the unusual powerplant design and the light car weight.

The engine is a 2⅞ x 4 in. twin-three, six-cylinder, being divided into two banks of three each, which are staggered. It is claimed that this permits of a short and strong crankshaft and an unusually compact powerplant which weighs 192 lb. The clutch and gearset, which are included with the engine in the unit powerplant construction, are accessible by lifting the hood. The cylinder blocks are set at a 30 deg. angle and are of valve-in-head type. The valves operate by direct pull from a camshaft placed in a separate housing in the "V" between the cylinders. All the rocker arms, push rods, tappets and similar parts have been eliminated by this type of construction and the designers claim that by this method thirty-six parts have been removed from each cylinder.

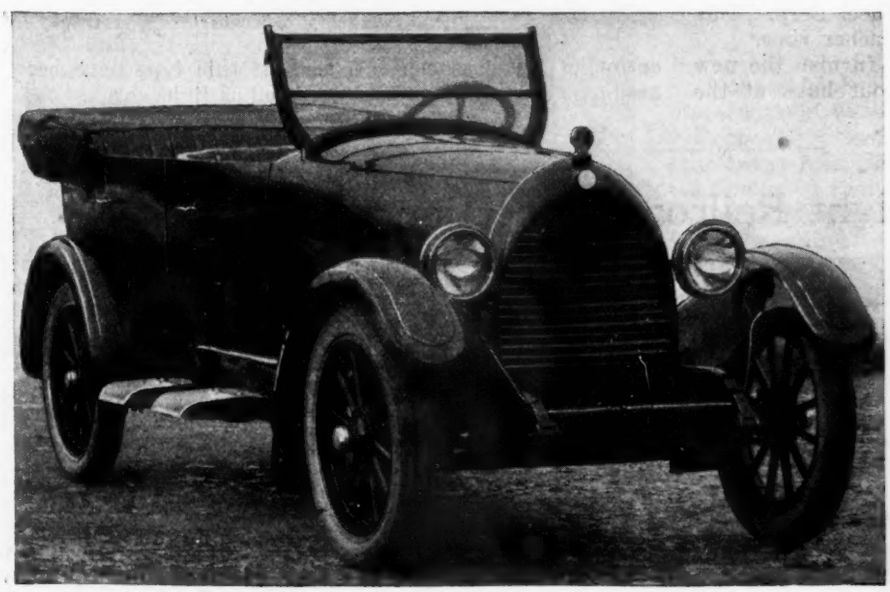


Camshaft housing and die-cast pump housing

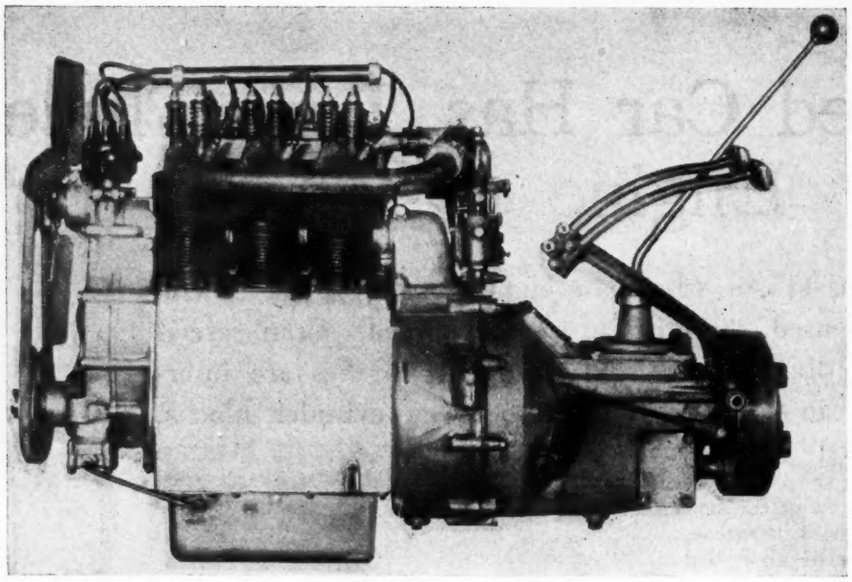
The valve adjustments are in sight at the top of the engine and by removing a clamp, it is possible to remove the entire camshaft assembly. The valves may be inspected and ground by removing the manifold and turning one part.

The cylinders are machined both inside and outside for uniform expansion which Doughty claims is one of the difficulties with air-cooled construction. Each cylinder has more than twenty cooling fins and the fan is supplemented by air-chutes which direct a constant current of air through the fins. The crankcase is a die casting weighing 14 lb., to which the oil-pan is bolted. When the pan is removed the pistons and connecting rods can be taken out. Extra long connecting rods are used to prevent piston slap, and aluminum has been used liberally throughout the power plant to save weight. The gasoline system is fed from a cowl tank by gravity to the carbureter. Vaporization is also assisted by a hot-spot. The intake manifolds are tapered to assist in distribution, and the intake and exhaust manifolds on both the cylinders are interchangeable.

Lubrication is provided by a pump driven from the crankshaft. Oil is pumped directly to the camshaft housing and the fan bearing is lubricated from the same source. Through another channel oil is pumped to the hollow crankshaft.



New Detroit air-cooled car



Left side of engine, showing short overall length

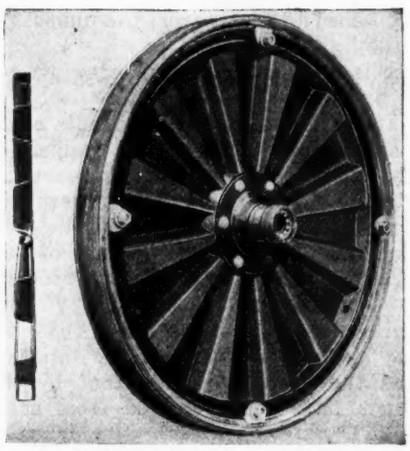
Both the service and emergency brakes are interchangeable, although the service brake acts upon the transmission, while the emergency brakes are on the rear wheels. The emergency brake lever is located at the left side of the driver. A novel idea which has been worked out in this car combines the throttle with the horn button, a disk being rotated to open and close the throttle, while the same disk, when pressed down, sounds the horn. The frame is 6 in. in depth and the body lines provide a high side body with wide doors. The springs are of the long, thin-leaved, semi-elliptic type and in order to assist the car in holding the road, the rear end is made slightly heavier than the front end. This, the designers claim, counterbalances the usual custom of a single driver with an empty tonneau, which very often causes a light car to be out of balance. The car is mounted on 31 by 4 in. tires.

A New Metal Disk Wheel

THE Gier-Lewis steel wheel, now being manufactured by the Gier plant of the Motor Wheel Corporation, represents a new departure in steel wheel design and construction for light cars. Instead of the curves or depressions in the disk running concentric with the hub, the new Gier-Lewis wheel is distinctive in that the corrugations in the disk extend radially from the hub to the felloe. This design makes it possible to use light gage metal and at the same time provide the necessary strength and rigidity. The wheel is said to overcome the usual objection to steel wheel equipment on light cars, as it is within a few ounces of the same weight as the standard wood wheel.

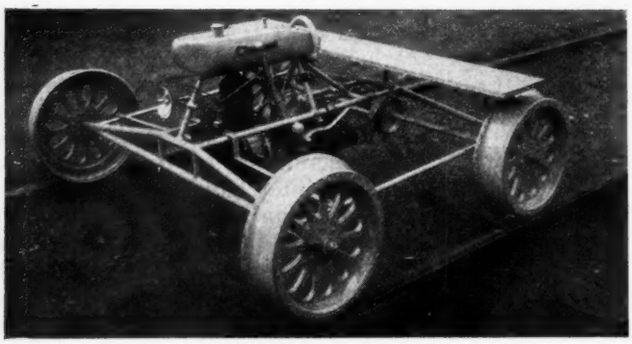
The center core is cast into the radially corrugated disk, the pouring of the core into the disk makes the latter an integral part of the hub casting. The outer circumference of the disk is welded into a standard steel felloe manufactured in the rim plant of the Motor Wheel Corp. This felloe will take either straight side or clincher rims.

Arrangements are now being made to furnish the new Gier-Lewis wheels either with or without hubs at the option of the customer. Wheels of this type have been used experimentally on heavy as well as light cars.



Gier-Lewis metal disk wheel

Lightweight Railroad Inspection Car



Cleveland railroad inspection car

A LIGHT-WEIGHT railroad inspection car has just been put on the market by the Cleveland Motorcycle Manufacturing Co.

The powerplant of the inspection car is identical with that of the 1922 model Cleveland motorcycles, except that the gear shift is being operated by a lever instead of by the right foot pedal as on the motorcycle. The weight of the machine is hung low, a large part of it being below the top of the wheel. Both rear wheels are driven and all four wheels are the same size.

The speed of the vehicle is low, ranging from 5 to 20 miles per hour. This is advantageous for the purpose for which the machine has been designed, since proper inspection work cannot be done at high speeds.

A Mechanical Gear Shifting Mechanism

Actual shifting of gears is accomplished by cam blocks actuated by motion of the clutch pedal following the selection of the desired gear by a finger lever. Mechanism is compact and is said to weigh less than parts it replaces. It is entirely mechanical in operation. A driving seat space saver.

THE Gear Shift Department of the Cutler-Hammer Mfg. Co. has developed a smaller, simpler gear shifting mechanism, which, while not previously announced to the trade, has been put to more than a year's service on several motor cars, its performances having been closely checked.

The shifting mechanism occupies little space and is said to weigh no more than the parts it replaces. It is mounted on top of the transmission, as shown in the photograph of the Cadillac installation herewith, the latest type (fitted to the Elgin car) being so small that the inclosing case occupies only the space between the transmission case and the floor board. On the Cadillac car the hand lever is replaced by the automatic gear shift mechanism, and emergency brake lever is moved to the extreme left. The entire front seat compartment is thus clear.

Shifting of the gears is accomplished by means of cam blocks. These are made of a single piece of steel, machined and provided with different cam profiles. With a given speed pre-selected by means of the finger lever, throwing out the clutch results in the shifting of the gear. Coasting by releasing the clutch pedal part way without shifting is also possible, since a gear change is not made unless the pedal is moved past a point indicated on the vertical elevation.

The accompanying diagrams will serve to make the operation of the gear shift clear. Referring to the drawing of the shifting mechanism, the movement of the selector lever on the steering wheel quadrant, through the various linkages, moves a pair of roll levers inside the gear shift casing into the position corresponding to the speed selected. Then, when the clutch pedal is depressed, the cams are rotated, one roll lever being moved into the selected gear position, the other held rigidly in the neutral position. Owing to the slot in the slip link, the initial movement of the clutch pedal can take place without moving the operating rod of the shift.

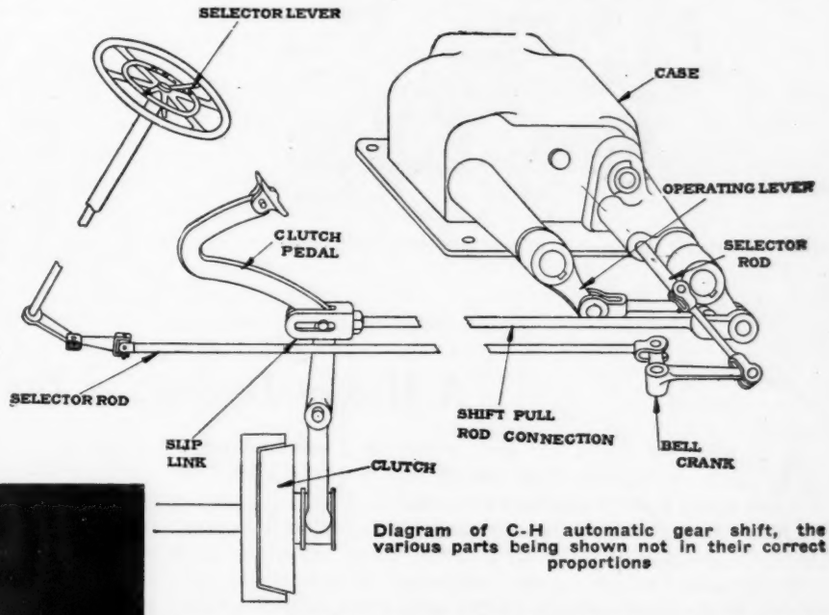
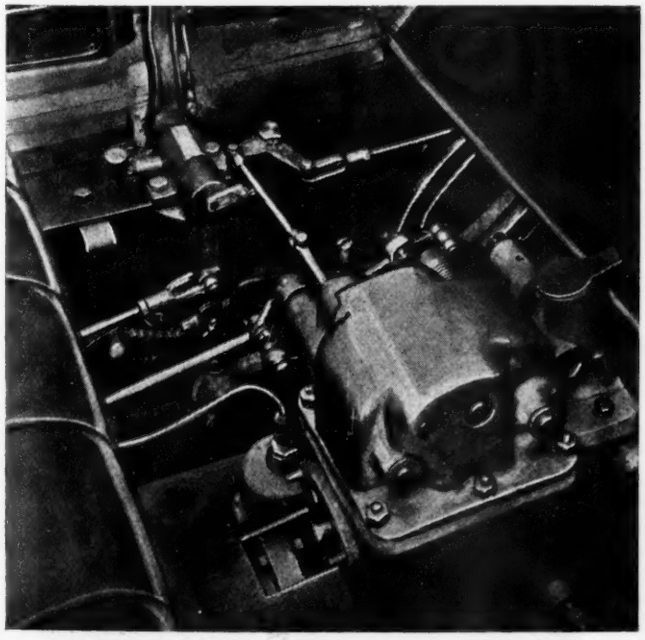


Diagram of C-H automatic gear shift, the various parts being shown not in their correct proportions



C-H automatic mechanical gear shift applied to Cadillac car

Each of the two roll levers acts with a pivoted fork, each being free to be moved forward and backward independent of the other fork and roll lever. With the case and its contents mounted, as shown on the Cadillac car, arms extending from the shifter forks drop down into the transmission and shift the gears into the speeds selected.

The cam blocks previously referred to operate on two sides of the rollers carried by the roll levers. Pushing the clutch pedal forward moves these cams through a limited arc in such a way as to move the roll levers forward and backward.

The diagrams show how these rollers act in connection with the cams. In the reverse position, R, one roller is opposite the neutralizing cams and the other is held between the upper cams of the blocks, which causes the forks to neutralize the gears and throw them into reverse. The rollers are held in position by the cams, preventing the slightest overthrow.

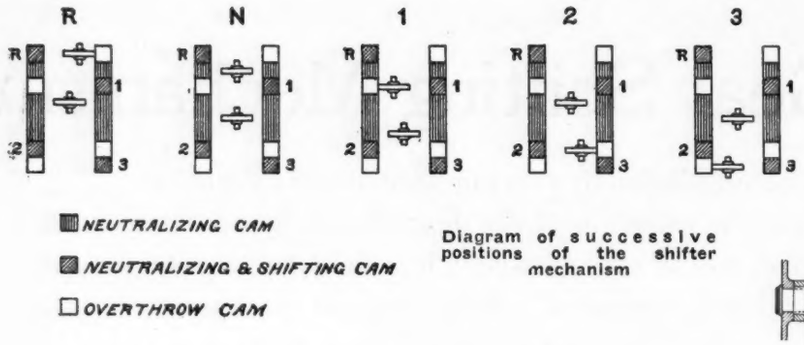
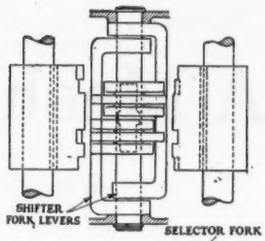
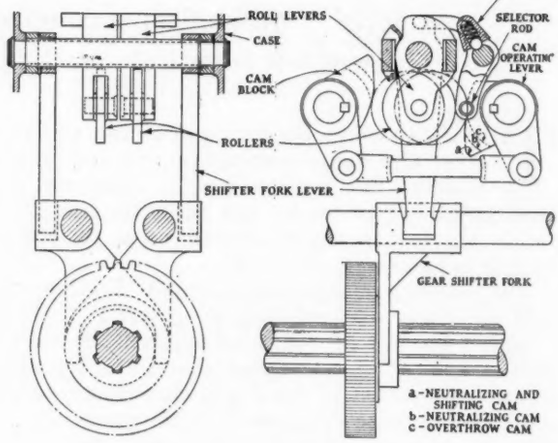


Diagram of successive positions of the shifter mechanism

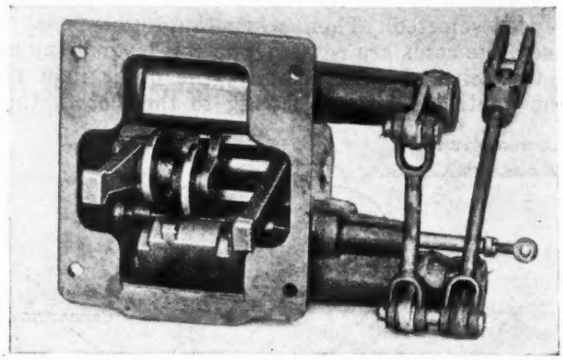


Three projections of the gear shifter, showing arrangement of all parts



In the neutral position, N, the rollers are held between the neutralizing cams, while in the next position one roller is still between neutralizing cams and one between a shifting cam and an overthrow cam. The positions of the rollers for second and third speeds are also shown.

It will be observed that the gears are positively held in position, no reliance being placed on springs. The friction of the sliding gears and shifting mechanism is very slight, and it is claimed that the operator cannot notice any difference in the amount of pressure required to depress the clutch pedal.



Photographic view of the gear shifter mechanism from below

Manufacture of the magnetic gear shift is being continued by the Cutler-Hammer Mfg. Co., this shift being an option on the Premier car.

A Heavy Hydraulic Body Press

AN all-steel press for use in forming pressed metal parts for automobile bodies has recently been constructed for a large producer of such bodies.

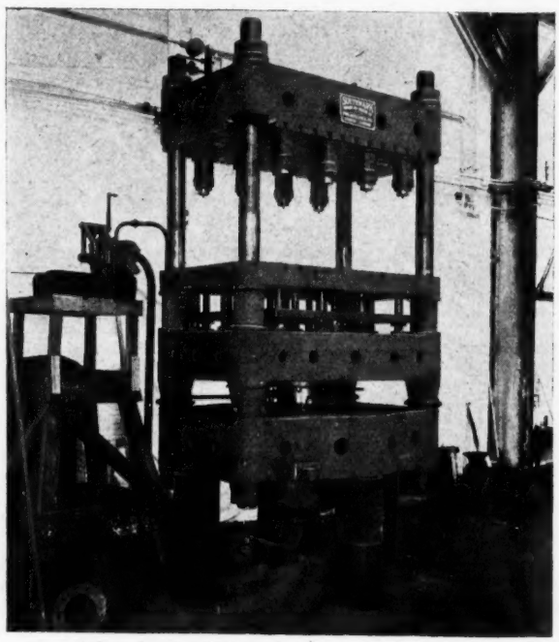
By reference to the accompanying cut it will be seen that the main ram is located in the lower base, to which are secured the four press columns. The press is provided with one clamping platen and one stripper platen. The heavy stripper platen carries four hydraulic cylinders, which act upon a forged steel plate which, in turn, carries sixty stripper pins 1½ in. in diameter. These stripper pins project through the clamping platen.

The clamping platen itself is a solid steel casting and is provided with T slots. The top platen carries 8 hydraulic jacks which are used for clamping and which have 5-in. diameter rams, 5-in. stroke. The top platen itself is adjustable so as to meet conditions of the various sized dies which may be employed under the press.

This press is controlled by a single lever operating valve, which admits low pressure to the four jack cylinders and at the same time admits low pressure to the main ram. As soon as the dies come together high pressure is admitted through the steel operating valve, thus completing the work on whatever shape is to be formed in the dies.

The clamping cylinders are controlled automatically from low-pressure filling tank and are capable of standing a hydraulic pressure of 5000 lb. per sq. in.

This press has a die space of 7 ft. by 5 in. and vertical opening between the platens is 18 in. minimum and 4 ft. maximum.



Southwark hydraulic body press

Gear-Driven Airship Has Novel Transmission Features

This new military airship of the pony blimp type, being built for the government, has new mechanical features. Power is transmitted from engine set in central car to two propellers at sides through spiral bevel gearing with reversing feature, at reduction of 2 to 1. A detailed description.

By H. T. Kraft*

THE envelope of the new military airship being built for the U. S. Army is of the pony blimp type, having an aspect ratio of 3.6 to 1. While there has been considerable question as to the head resistance of a large diameter ship, the entire absence of tail droop and the maintenance of a perfect streamlined shape on non-rigid ships are items which are usually overlooked, and are important factors tending to reduce the resistance of the envelope, apart from the fact that there is a tremendous reduction in skin friction due to the short length of the hull. From a dynamic standpoint, ships of a small aspect ratio have been considered somewhat unstable, but there, again, the high static stability due to the low center of weights, of course, is not represented in wind tunnel tests on the model of the envelope itself, and a ship of this type should be as stable, in view of this condition, as any airship of this capacity built in the past. The envelope and the car are faired together with an elastic fabric immediately below the envelope, making the entire ship a well streamlined body.

There is a great saving in surface weights of the envelope proper, in this particular unit over 1000 lb. With that, of course, goes the reduction in diffusion, which should be about one-sixth less than for ships of the same capacity built in the past. Because of the design, there should be no surging of the ballonet. The base line attachment to the envelope being greater than its lateral area, it is impossible for the ballonet to travel beyond this fore and aft base attachment point.

Arrangement of Control

The car is of the inclosed type, with two longitudinal sills 18 in. deep, which constitute the backbone or principal strengthening members of the structure. The balance of the car is simply a shell, housing the crew and permitting a closed car to be built of approximately the same weight as any open type of car constructed in the past. While the development of airships in the past has necessitated the adoption of various instruments, they were usually attached as an afterthought in a rather makeshift arrangement, but before attempting the construction of this unit, we formulated plans for the unification of the control. The control board carries every instrument that is required for successful lighter-than-air navigation, and is set in the car in such a manner as to permit all instruments to have the highest degree of accessibility. The pilot controls the entire transmission, clutches, reversing device, etc., from the navigating cabin. The engineer is located in a separate cabin to the rear of aft surging that is usually experienced when a car is hung too far away from the hull. The dispensable load is located directly under the center of volume of the ballonet, thereby permitting a single ballonet to be used, without any possibility of getting out of trim, irrespective of the loads carried within the car.

The Transmission Problem

After going over all the data we could secure on transmissions built in the past, we well realized the problem that confronted us, as there had been so many failures along this line. The outstanding difficulties in the past had been heating up of the oil and excessive torsional vibration also, the transmission would get out of step with the motors, causing excessive gear noise. It was our aim to design a transmission that would be entirely free from these defects. In closely scrutinizing the construction of other gear drives, we found that the principal defect was the lack of unit construction, the designer depending upon struts or other connections to the car or fuselage, and in the case of airplanes, upon attachments to the wing struts, which, of course, invited trouble.

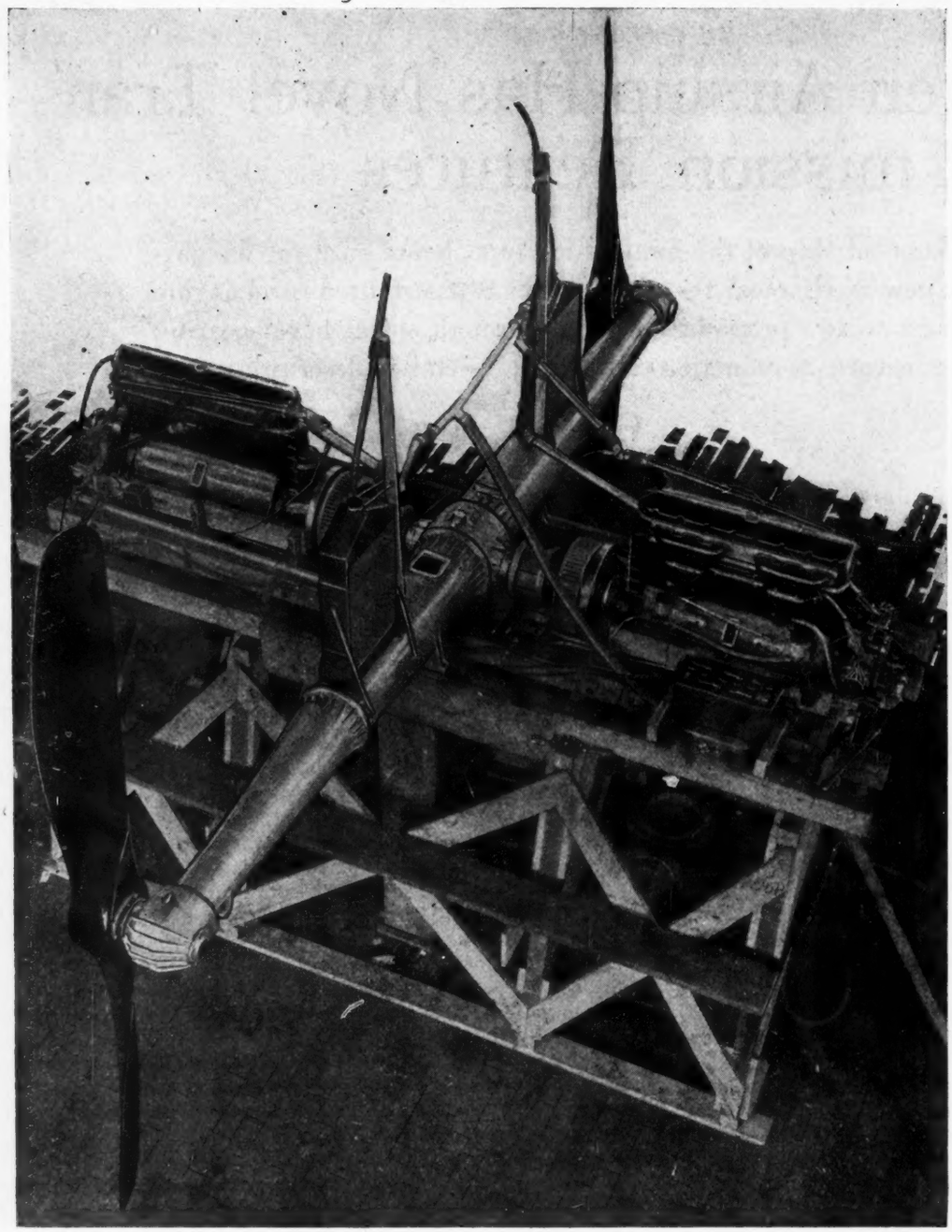
In laying out plans for the Goodyear transmission, our first thought was to make the entire assembly one integral unit, that is, to build the clutches, couplings, gears, shafts and propeller gear housing as close together the car, with an instrument board for reading all pressures and temperatures of the motors and transmission assembly. The mufflers are of the dual type, in which a part of the air which is delivered to the ballonet is circulated around the exhaust chamber and then into the exhaust itself, to assist in muffling the exhaust noises.

Water Ballast in Floor of Car

Water ballast is carried in the floor of the car immediately below the navigating cabin, in which latter there is a dial indicating the amount of water available for ballast. The fuel tanks are located in the rear part of the navigating cabin; there are two 160-gal. tanks, so constructed as to permit them to be used as sleeping cots in case of long flights. Provisions are made for a crew of seven.

It will be noted that all suspension cables run to the floor of the car, thus permitting veneer sides of 3/32-in. thickness to be used. As all loads are concentrated at the floor line, the surge of the car while in flight is resisted by two lateral cables and four longitudinal cables attached to the center bulkhead. This, in addition to martingales, which are also attached to the floor line, have proven very successful in overcoming the fore-and-

*Chief Aero Engineer, Goodyear Tire & Rubber Co.



Powerplant of Goodyear gear-driven dirigible on testing stand. Two Aeromarine 135 hp. engines connected through friction clutches, fabric universal joints and spiral bevel gear transmission gear to two propellers at side of testing stand

as possible. It was largely on this basis that the success of the transmission was assured. We next analyzed the gears of several different types of transmissions and found that the use of straight bevel gears resulted in excessive gear noises.

Spiral Bevel Gears Used

The Goodyear transmission contains spiral bevel gears as used for the rear axle drives of automobiles. The teeth are of 4/5 pitch, have a 30 deg. angle of spiral and were cut by the Gleason Gear Works of Rochester, N. Y. In making the preliminary test run on a dynamometer, we found that there was an entire absence of gear hum, and while this dynamometer test forced us to allow two gears to idle in the case, we experienced very little heating up. To determine the absolute efficiency of this unit in the airship itself, we constructed a large wooden stand upon which were mounted two Aeromarine 135-hp. type U-6-D engines fitted with two clutches of the multiple disk type, manufactured by the Twin Disc Clutch Co. of Racine, Wis. Couplings between the clutches and the transmission are of the flexible type and are so designed as to allow of some degree of misalignment and angularity.

While theoretically this unit is in perfect alignment, the couplings were inserted to absorb any misalignment that might occur due to the weaving of the car proper. The transmission tube, which is one complete unit, is held on the cross sills by eight bolts at the outer edge of the car. A test load of 1000 lb. was hung on the propeller tip with a deflection of only 0.098 in. We were thus convinced that a propeller of only 80 lb. would not cause any excessive bending of this tube. Also, the thrust of the propeller, which is approximately 700 lb., is provided for with a theoretical factor of safety of 8. The tubes were cast by the Aluminum Manufacturers, Inc., of Cleveland, Ohio, and were produced of their No. 195 metal, heat treated, having an ultimate strength of 40,000 lb. per square inch, or approximately twice that of plain cast aluminum. The elastic limit of this metal is 30,000 lb. per square inch.

The propellers were attached and all necessary clutch adjustments were made before the motors were started on the stand run. We found that at half power, with both motors, the tubes were absolutely steady and there was an entire absence of gear noise, while the oil temperature rose only gradually, but we opened both motors wide and both tachometers indicated 1550 r.p.m., giving a propeller speed of 775 r.p.m. This being a static test, the propellers would go up to their design speed of 800 r.p.m. in flight. The motors were left open for three hours, at which time the center gearbox showed a temperature of 78 deg. Fahr., or 13 deg. above room temperature, which for a transmission of this type is quite remarkable. At this speed and during its entire operation there was not the slightest sign of vibration and an entire absence of noise, gear hum or any mechanical trouble that would indicate improper design. An additional run of 10 hours was completed without the necessity of making any adjustment on the transmission.

While the preliminary drawings and general arrangement were laid out by the Aeronautical Design Division of the Goodyear Tire & Rubber Co., the entire detail design and production of the transmission was put in the hands of John Riise, chief engineer of the Tractor Division of the Wellman-Seaver-Morgan Co., to whom we credit the remarkable success of the transmission unit.

The weight of the transmission without propellers is 593 lb. The blowers and clutches weigh 88 lb. This is only slightly greater than the weight of outriggers on some of the airships built in the past.

Advantages of the Gear Drive

The transmission-driven airship permits the motors to be placed within the car, where they are very accessible, and, in the case of non-rigid and semi-rigid airships, sirocco type fans may be attached directly to the motors, thereby permitting the elimination of scoops, which offer considerable resistance and add considerable weight. It permits any mechanical adjustments to the engines and, in the case of the unit above described, a complete cylinder head could be removed while in flight. As the heating is a direct indication of power losses in a transmission, the entire absence of this trouble in the Goodyear type transmission leads us to estimate that an efficiency of 98 per cent is obtained. As the propellers are 11 ft. in diameter and have a pitch of 10 ft. 6 in., and as the head resistance is reduced and there are no protruding members, there should be a considerable gain in the speed of the unit.

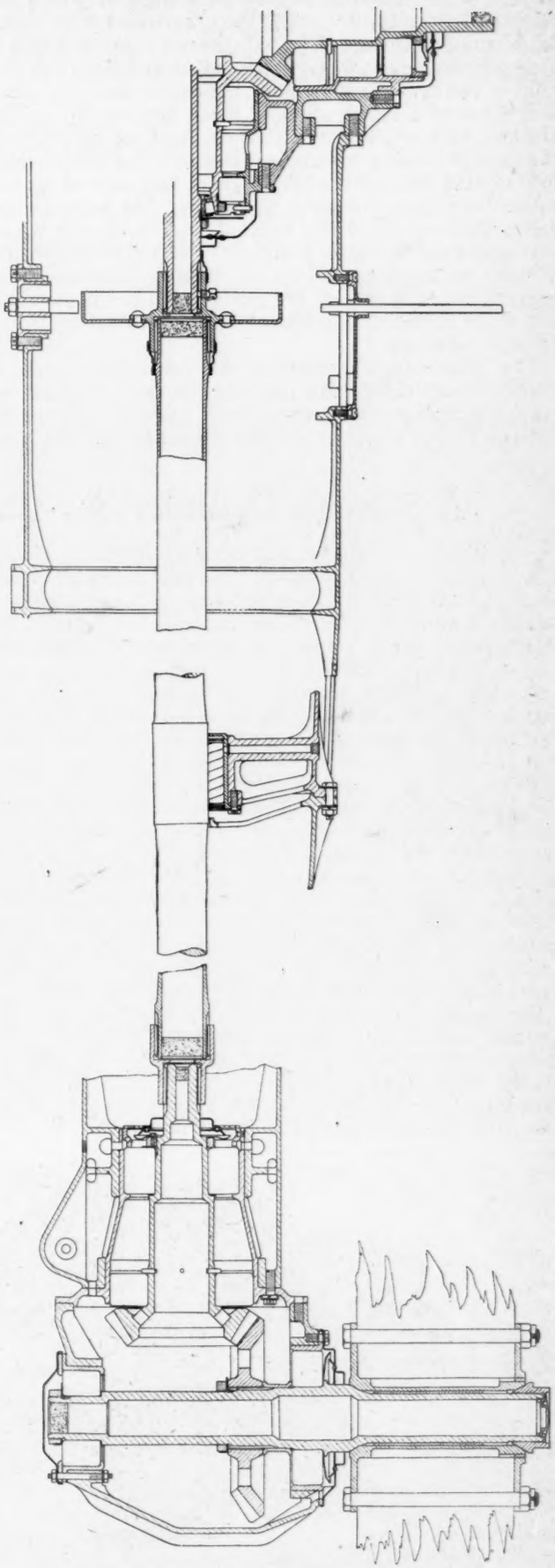
In view of the unit arrangement of the transmission, a reverse gear was inserted, which permits the propellers to be reversed without difficulty. The tractor type propellers were so arranged as to permit the edge of the tube to be streamlined. The radiators are to be set on bosses located on the tube, thereby placing them directly in the slip stream. The tractor type propellers offer the advantage of greater safety by keeping all these mechanical parts to the rear of the blade.

The characteristics of the unit are as follows: Speed, 60 m.p.h.; rate of climb, 1000 ft. per minute; rate of descent, 800 ft. per minute; cruising radius, full throttle, 14 hr.; cruising radius, reduced throttle, 20 hr.; percentage of useful load, 39; length, 170 ft.; diameter, 48 ft.; crew, 7.

While this is an experimental airship, it has proved that even with the inclosed car, transmission, reverse feature and two additional passengers, it is a decided improvement in the non-rigid class. Ships of this design could be constructed up to 300,000 cu. ft. capacity without the slightest difficulty. The entire design adapts itself to the insertion of a rigid keel, which would permit ships up to at least 1,000,000 cu. ft. to be built with a tremendous saving in the structural weights and with an assurance of a very high percentage of useful lift.

Additional Data on Gear Transmission

AUTOMOTIVE INDUSTRIES is indebted to John Riise for additional data of the gear transmission and blue-prints of parts of same, reproduced herewith. The gears, as already stated, are of 4-5 pitch, hence are of the stub-tooth form with a pressure angle of 20 deg. Their width of face is 1½ in. At the center of the transmission there is a nest of four spiral bevel gears meshing together, of which the two with their axes in the fore and aft direction are connected to the clutch shafts by the Goodyear fabric flexible universal joints. The driving gears have 24 teeth and the driven gears 34 teeth each. The gears are formed integral with their shafts, which latter are hollow and provided with splined fittings. Each gearshaft



Sectional views of parts of the spiral bevel gear transmission

or hub is supported in two ball bearings, of which one takes radial loads only, while the other takes both radial loads and end thrust. The ball bearings are mounted in steel sleeves or housings which are shrunk into the aluminum casings. That is, both the casing and the sleeve are raised to a temperature of about 200 deg. Fahr. and slushed with oil, and the sleeves are then forced into the casings under a moderate pressure. The driven shaft floats in the hubs of the driven gears on a pair of conical roller bearings. At their inner ends the hubs of the driven gears are provided with internal teeth with which corresponding teeth on a sliding member or clutch are adapted to engage. When this sliding member is in engagement with one of the gears the drive is forward, and when it is in engagement with the other gear the drive is reversed.

The central shaft carrying the reversing clutch is comparatively short, and just outside the oil guard beyond the bearing it connects by a splined coupling to another hollow shaft of greater diameter but less wall thickness. At this coupling there is provided a brake drum to which a contracting band may be applied for the purpose of quickly absorbing the momentum of the propellers and thus permit of quick reversals of the gear. In other words, the brake serves about the same purpose as the clutch brake in automobile transmissions.

An aluminum housing incloses the entire transmission. This is made in several sections bolted together, as with the very thin section of metal wanted it is impossible to cast the whole of the housing to one side of the center of the transmission in a single piece. The gears at the outer ends are of exactly the same dimensions as those at the center, the driving and driven gear having 24 and 34 teeth, respectively, of 4-5 pitch and 1½-in. face width. Mr. Riise confirms the statement made in Mr. Kraft's article that the transmission worked satisfactorily under conditions of continuous full load without vibration and without noise. The efficiency of transmission is apparently very high and there was only a slight increase in the temperature of the lubricating oil.

A Sixteen Cylinder Air-Cooled Rotary Aircraft Engine

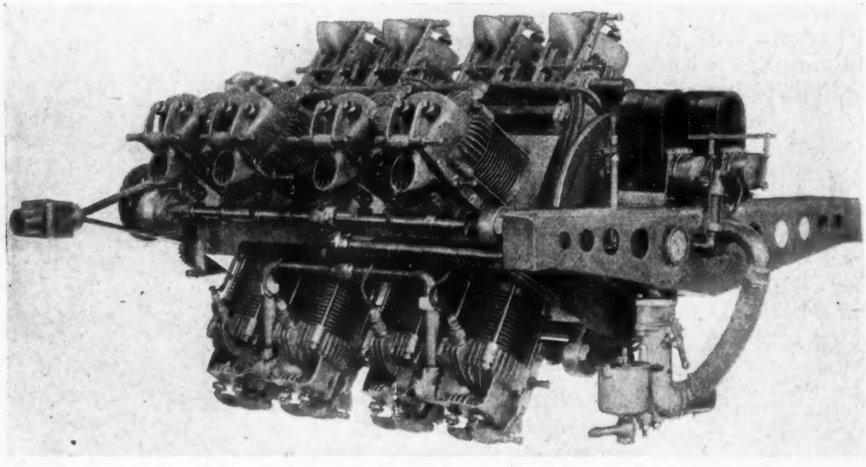
A NEW aircraft engine has been designed by Henry Trebert, long known in the gasoline engine industry. It is a rotary air-cooled type, and possesses the peculiar feature that the connecting rods are replaced by Scotch yokes rigidly connecting the pistons of oppositely located cylinders together, so that they reciprocate as a unit. The cylinders are arranged in groups of four, at angles of 90 deg., and the engine can be built with any multiple of eight cylinders. The axis of the Scotch yoke to which the pistons are connected is slightly offset from the cylinder axis, so that the yokes of two pairs of cylinders whose axes are in the same plane may pass each other. The connecting rod bearing is contained in a square box which slides in this yoke. The use of a common bearing for two opposite cylinders permits, it is claimed, of obtaining ample crankpin bearing surface. There are eight cylinders in a unit, with four crankpin bearings, and this is said to allow of a bearing width of 2 in. for each bearing. All of the eight pistons are connected to a single throw of the stationary crankshaft.

The poppet valves are mechanically operated, opening inwardly against the action of the centrifugal force and closing outwardly with the centrifugal force. Gas is taken into the motor through a carbureter connected to the hollow crankshaft. It then enters a distributing chamber separate from the crankcase, and from this chamber the intake manifolds carry it to the cylinders. These manifolds are of such design that the paths of the gases to all cylinders are of the same length, whereby equal distribution is assured.

On the sixteen-cylinder engine illustrated ignition is by two two-pole magnetos which are driven at twice engine speed, giving four sparks per revolution of the engine. The sparks from these magnetos are distributed to the various cylinders by means of a distributer consisting of contact brushes and a distributer ring comprising metal segments embedded in insulating material, which is carried on the engine at the forward end. There are eight explosions to every complete revolution of the engine.

Lubricating oil is forced through the hollow crankshaft to the crankpin bearings under a slight pressure. Radial holes are drilled through the wall of the crankshaft at the centers of the crankpin bearings. To other parts oil is distributed by centrifugal force. The engine is air-cooled by means of the usual cooling ribs on the cylinders. In order to intensify the cooling action on the exhaust valve a sort of air scoop is secured over the valve, which scoops up air as the engine cylinder block rotates and brings it into direct contact with the valve stem and head.

A new feature in rotary engines is claimed to be the provision of a case-hardened plate in the face of each Scotch yoke which works against a hardened bearing surface, and this rotates the engine. In this way the cylinders and pistons are freed of side thrusts. Among the advantages claimed for the engine are absolute rotating balance, simplicity of design and low weight. The engine is built by the Trebert Airplane Motor Co.



Trebert rotating aircraft engine

THE Manufacturers' Aircraft Association is attempting to compile a list of all the aviators in the country together with a general scope of their activities. It is hoped to have every operator in the country fill out this questionnaire, a copy of which can be obtained by request to the association at 501 Fifth Avenue, New York City.

New Features Added to Many 1922 Body Models

Although manufacturers are striving for lower cost of production there is no tendency to cheapen the product by using inferior materials or leaving off appearance improving equipment. A detailed study of designs exhibited at the New York show revealed several new points of interest.

By George J. Mercer

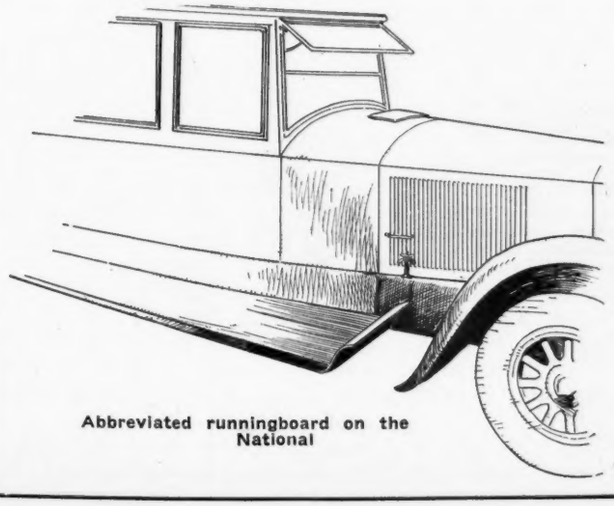
A STUDY of details of passenger car body designs at the recent New York show brought to light a number of new features. A noticeable point in connection with these features was the use of them on so many new models. It was largely due to this fact that a casual inspection gave the impression of great similarity in construction. In fact, many a visitor was heard to remark, "They all look alike to me."

Dealers, however, who visited the exhibits of the cars they sell were inspired by changes that have remedied some faults that were previously so apparent. These changes were clearly visible to the family of business associates whose living depends upon the product of the manufacturer.

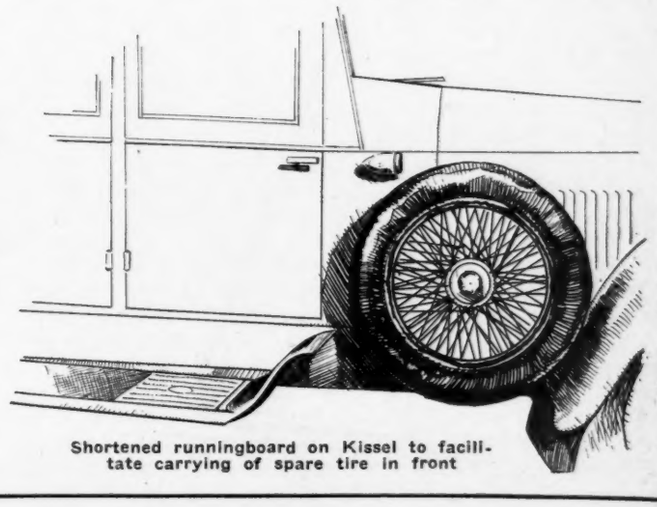
A few of the bodies were absolutely new and were shown for the first time as a manufacturer's model. One of these was the inside driven cabriolet—exhibited by Lincoln, Vauxhall, Stevens-Duryea and Roamer and illustrated in a previous article in AUTOMOTIVE INDUSTRIES. All of these models were good examples of body work. The inside driven cabriolet is new in a few respects only. It has been used on British cars for many years, but until recently failed to find favor in this country. The changes made to adapt it to the American market included removing of the collapsible roof feature. To the casual glance, however, the principal characteristics of the collapsible roof are retained, the most noticeable of these being the outside joint at the rear quarter. The question naturally arises as to the need of retaining features that do not add to the usefulness of the body and are, therefore, an unnecessary expense. It cannot be denied, however, that the retention of some of the original features, although not actually necessary, do add to the exterior appearance and balance of the design. Not all bodies shown made use of the joint, however, since its use necessitates omitting the window in the quarter or else making it very small. The advantages of the larger window are apt to outweigh the style appearance that the use of the joint conveys, with the result that it will probably be used to a less extent in future designs.

On these bodies, however, the use of the full door and the elimination of the folding feature have made a more acceptable body for the American public. This feature eliminated means less rattling and a longer life to the leather or fabric covering the top.

Another new feature of 1922 models is the close coupled body, of which the Jordan and Maxwell are examples illustrated. This design is one that will probably find increased favor as time passes. It is intended to meet the demand of the buyer who is not satisfied with the rather cramped seating accommodations offered by a coupe and who is not willing to have as large a body as the regulation sedan. Others exhibiting this type of body were Stanley, Patterson, Earl, Essex, Peerless, Cole, Stearns, Franklin and LaFayette. The majority of these bodies had two doors, with the front seat made in two sections, the right one being made to swing about for access to the rear of the car. Several had the driving seat made to fold, to permit the occupants to get out from the left side in case of emergency. A few of these bodies had four doors, as shown on the Maxwell.



Abbreviated runningboard on the National



Shortened runningboard on Kissel to facilitate carrying of spare tire in front

These bodies have an advantage in seating over the average coupe, because the rear seat is built straight across. In fact, the seat accommodations are the same as the sedan, but closer set up, and some of the manufacturers advertise them as sedanettes. Essex uses the name coach, and there are some other appellations given the design.

It might be asked why the Body Standards Committee of the S. A. E. did not clean up the matter of naming this model. Their reason probably lies in the fact that time will be required to sift it into more sharply contrasting lines and that, for the present, it will be best considered as belonging either to the coupe or the sedan class. With the two doors it belongs to the coupe and with four doors it will be nearer the sedan.

There is somewhat of a tendency on the part of manufacturers to create a low-priced, durable service model body that will be acceptable as a closed body for business purposes. Dort showed this type in both the four- and two-passenger models. The latter is probably the most sensible size for this type.

There was a rather general tendency among exhibitors to place the spare tire at the forward side. This is the first time that quantity-built cars have made use of this location for the spare tire. Addition of trunk racks at the rear is largely responsible for the change. The two illustrations, one of the Kissel and the other of the National, show the runboard shortened to permit the carrying of the spare tire in this position.

All styles of trunk racks were used. Some were of the platform type, while others used the folding rack. The majority, however, used the stationary slat design. With but few exceptions, the rack and the guard rods were nickel or bright metal, wood slats forming a base for the trunk.

Among the larger sized bodies shown, the illustrated Pierce-Arrow berline is a good representation. The slant front may be noticed, and this is common with this type of body. The slant pillars on this body, however, are much lighter than usual, and the front is exceptionally light and attractive looking. This picture also shows the fabric visor, which was used on a majority of the cars. There were a variety of visor designs. Some were painted metal, others metal covered with fabric and in some cases fabric was fastened over a frame. The finish at the ends also varied, some having the flat panel supported by brackets and others having the ends closed by the fabric, as shown on the Maxwell and the Jordan.

For appearance, the last two named are superior. There is a more complete and finished look to these than to the type having open ends and supported by brackets. There were a few glass visors, some being painted, while others had the frosted finish.

Exterior features of inclosed bodies, generally, harmonized with the best characteristics of last year. The single wide belt molding, the ventilator top of shroud, the lower part of windshield stationary, the use of dash lamps and a slight increase of the use of the soft roof were the predominating features on new models.

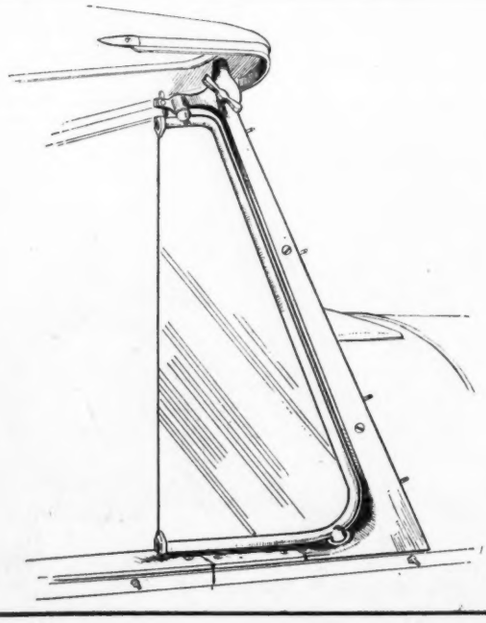
Some doors were made flush, some with the overlap and others with moldings. More outside hinges were used than the concealed. The straight bar handle was general and this was divided about equally between nickel and black finish.

There is a lack of uniformity in the manner in which the doors on inclosed bodies are made to open. On open bodies it is the general practice to have the hinge at the front of the door. On inclosed bodies the best practice for satisfying the largest number of users is for four doors to open with their handles together at the center. Two-door bodies, as on the coupe, give greatest satisfaction when the doors have the hinge at the front. Five of the close coupled bodies at the show had two doors. Four of these were hinged at the front and one at the rear. Of the four-door type four bodies had the doors open with the handles at center and one had doors hinged at rear. From these examples it would seem that the newer bodies have a tendency to be more uniform as to methods of hinging.

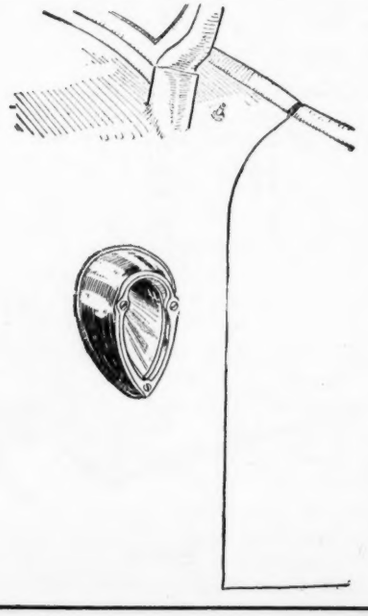
Nickel was more generally used this year than ever before. Approximately two-thirds of the exhibitors had one or more cars with all-nickel or nickel-trimmed headlights. One-half of the cars with nickel headlights had nickel radiators and there were three with gold plate.

Nearly all the headlights were the drum shape—dash lamps corresponded in pattern to the headlights. Windshields on open cars were also quite often trimmed with nickel.

The illustration of the windshield foot on the Chalmers shows the tendency to change the method of attaching



Auburn design of side wing forming integral part of windshield



Courtesy light on Willis-Sainte Claire

1—Maxwell coupe. 2—Maxwell coupe, forward section. 3—Interior of Itala. 4—Lexington phaeton with trunk rack

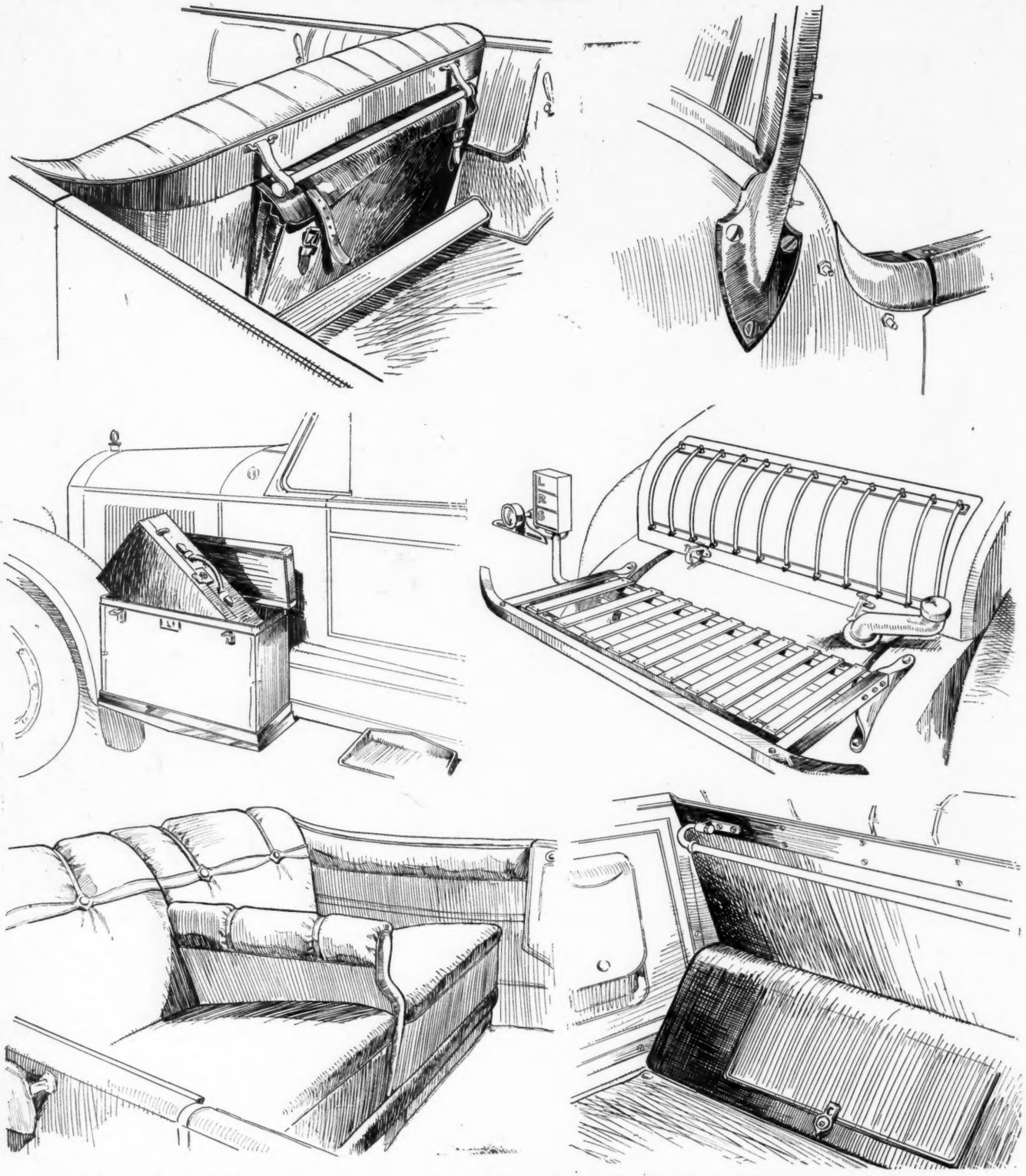
the shield to the shroud on open bodies. This is due to the prevailing round lines on radiator, hood and shroud. The illustration of the Chandler phaeton shows one of the new body designs in which the round lines of the front are well carried out.

This body carries the convex on the body side and the top edge of the body is drawn in. The rounding is taken from the body thickness and the top edge is thinner than usual and rounded over. One other feature on this body was the use of flush ventilators, which is an improvement over the conventional type. As shown, the shield has side wings. These wings were well represented and there is evidence that thought is being concentrated along the lines of developing improvements in open car windshields. The illustration of the Auburn shows a new design side wing that is an integral part of the shield. The Leach used a shape that is similar to that used by the Paige, and some others attempted to make the shield side arm nearer perpendicular at the rear. This was done to facilitate the fastening of the storm curtain, the idea being to accomplish this object at less expense.

The problem of storing the storm curtains on phaetons has occupied the attention of some designers. In some instances a space in the back of the front seat has been utilized for this purpose. The illustration of the Lexington shows one way that this locker space may be covered, the bellows pocket being so arranged as to cover a recess in the seat-back. Others use a natural wood finish door; in fact, the rear of the front seat was quite often finished with wood and had small locker space above the curtain pocket. The use of wood on open bodies was used to a considerable extent as a covering for the top edge. It is advantageous to have some protecting edge to the top of the doors on these bodies, because in opening and closing the doors, as well as at other times, the hands of the occupants of the car rest upon this surface.

The illustration of the Itala body shows a box footrest. This was seen on several cars. On the one illustrated it was used to contain the storm curtains, but generally it formed a toolbox. It was made both as a separate unit and as a part of the seat-back. It was generally shorter than the width of the body to allow easy entrance, and the outer corners were rounded.

The rear section of this same body shows the permanent division of the rear seat and the trimming design of Spanish leather. Use of this leather for trimming material on both roadsters and phaetons was more general than in previous years. It was also used for trimming the driving compartment of berlines.

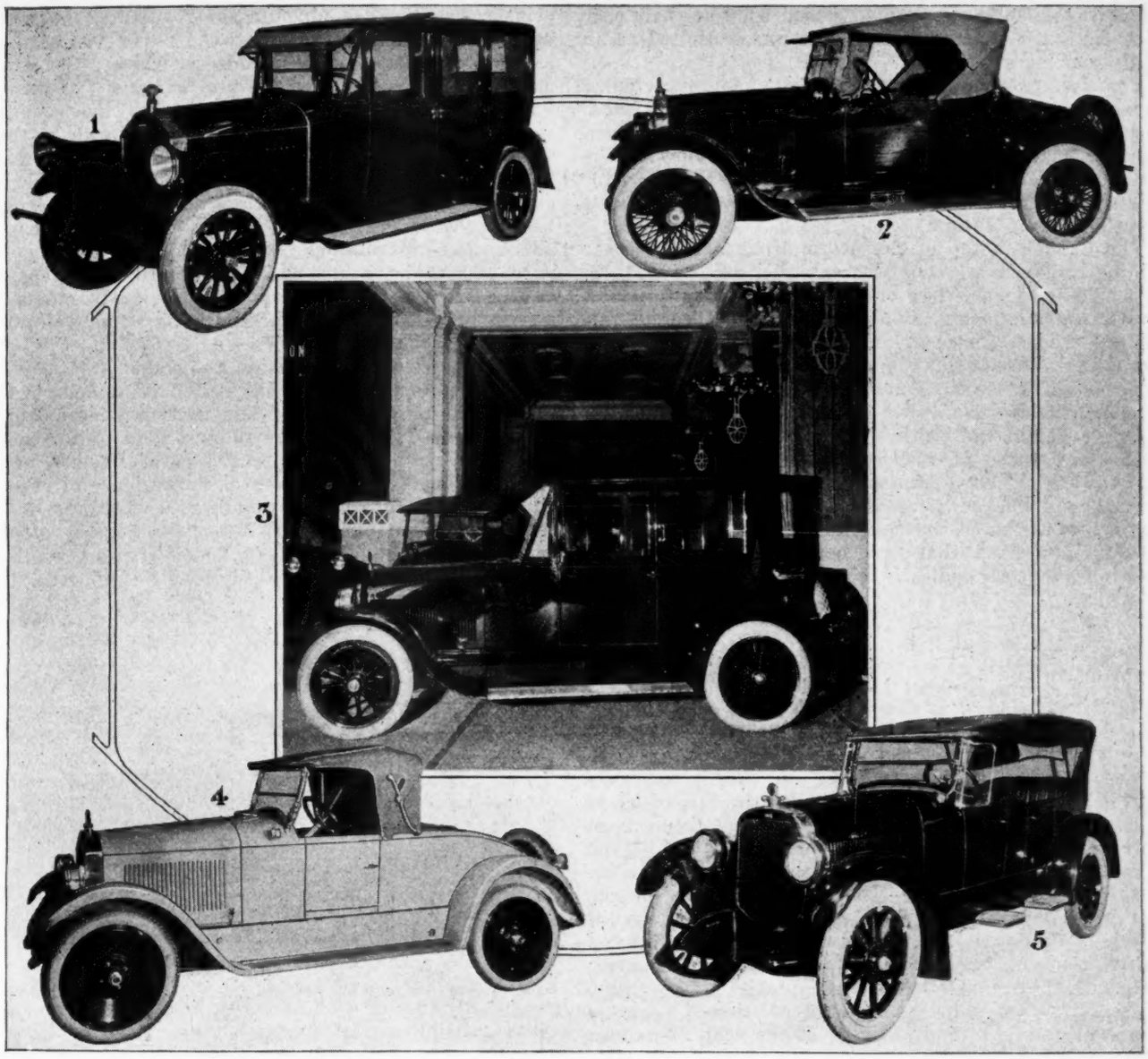


(Upper left)—Lexington method of storing storm curtains on back of front seat. (Upper right)—Base of windshield bracket on Chalmers. (Center left)—Auburn suit case carrier. (Center right)—Leach trunk rack. (Lower left)—Itala permanently divided rear seat. (Lower right)—Itala box foot rest

The extensive use of this material, together with nickel parts, increased use of the trunk rack, as well as the fact that a number of cars were equipped with khaki-colored fabric tops with wood bows and nickel slat irons or sockets, indicated that the sober car has taken a temporary recess.

The body builder is now, and has been for some time past, making one dollar the equal of two and sometimes three in purchasing power for his product. Low selling price is the ultimate goal of practically every manufacturer. Yet only in the service car do we see the effect of cheapened value. The standard body has as much merit as a specially built article. Good workmanship and good material are the rule and more of the ornate is to be seen than ever before.

The deduction that can be drawn from the above summary is that the car manufacturer, strive as he will to bring the body cost to a new low level, is not willing to go before the public with an inferior article. Therefore, the bottom in body prices sought is something that



1—Pierce-Arrow berline. 2—Buick roadster with novel top. 3—Jordan coupe. 4—Moon roadster with special top. 5—Chandler phaeton with round lines

is desired in excess of what will be actually attained. The effort to reach the goal will be productive of results, but never at the sacrifice of the product.

The interiors of the inclosed bodies present further evidence in support of this summary. There was not a body, with the exception of service models, that did not have all the garnishment of former years and perhaps a few more.

Two of the illustrations presented herewith, one of the interior of the Itala brougham and the other of the Maxwell coupe, are examples of this fact. Both, however, were more ornate than the average. The former was trimmed with gray wool fabric having a fine black stripe. The rear seat was divided and the trim design was plain. The wood trimming was Circassian walnut and vanity cases were made of the same material. There were also toggle grips and foot pillows and pockets on the doors. The Maxwell was a show job, trimmed with silk brocade and an all-metal finish of gold.

As to the materials used in the various used cloth trimmings, velours and wool fabrics were about equally divided. On the new models, wool fabric was favored and the preferred color seemed to be dark gray with pin stripes. Grays that had a considerable mixture of green were also used, as were some blues. On the town-car types, broadcloth was the favorite. Vanity cases were usually the visible, natural wood finish. Very few concealed vanity cases were used.

Pockets on the doors were the rule. Robe-rails, footrests, heaters, dome and corner lamps, as well as silver-finished interior hardware, were commonly used. The use of natural wood trim is trying for a comeback. The Noma sedan had the entire roof panel of wood, as well as the standing pillar inside, so finished. This year will see many of the little interior furnishings that go to embellish the special body made part of the equipment of many stock cars.

The capacity of the medium-priced inclosed body model was five passengers. The new Durant and Rickenbacker had this size on all models. Many of the cars, however, having small capacity inclosed bodies had seven- as well as five-passenger phaetons. The majority had, however, the regulation five-passenger sedan, four-passenger coupe and roadster. Two manufacturers

showed the new close coupled closed body as their only inclosed car. In other instances it was exhibited as an additional model.

Top designs on phaetons have not undergone change except that more used khaki-colored fabric and more tops were lined than usual. A few were made with semi-victoria quarter curtains. The illustrated view of the Moon roadster is an indication of one way that tops for this type of car are designed. That of the Buick shows yet another top design.

The California top of the original character was exhibited by Leach. It was also exhibited by the H. C. S. in a modified form. Two other cars had tops of regulation California design, as it has been made over to suit eastern trade. There is no evident leaning toward a more general use of this top, despite its many advantages. The cost of these tops are their greatest impediment to more common use.

Color combinations exhibited were varied enough to enable any phase of discriminating taste to be suited. There were only two unhappy color combinations. If the colors displayed are indicative of what the production colors are to be, maroon and black have superseded the blue and black that have been the standard for so long on inclosed bodies. In some cases, when these colors were used on phaetons or roadsters, the wheels were red. Sometimes natural wood finish was used and at times wire wheels were nickeled or white. Disk wheels usually had nickeled rim and hub flanges.

Yellow, when used for inclosed bodies, was combined with black, and on open bodies with brown or blue. The extent to which colors were used can be estimated by the fact that over two-thirds of the bodies had bright or near-bright color combinations. This does not include bodies that have merely added striping. When we add to these attractions the large number of cars with wire and disk wheels, cycle mudguard and steps, together with the various features previously noted, the attractiveness of the body presentation ranks well ahead of previous years.

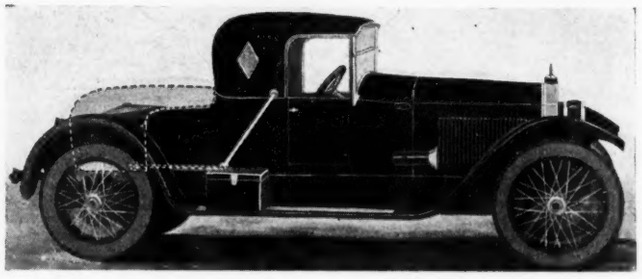
From the viewpoint of design, the bodies are uniformly good. Conventional trade has stabilized various models for specific use. The line of demarkation is more defined, the selling quality is the strongest controlling factor, and the writer's deduction, from a careful review of the season's offering, is that there is no evidence of cheaper quality or methods of manufacture to warrant the current talk in the trade of very low-priced bodies. Neither is there any evidence of cheap models that are available as substitutes for the standard models exhibited.

A New Type of Convertible Body

THE body shown in the accompanying cut has been designed to meet the demand for a body which can be quickly changed from the open to the closed type, and vice versa. This body is similar to that used in roadsters seating two to four persons, except for the top, which is of rigid construction, preferably pressed from sheet metal. The top is arranged to perform a double function. It can be used to form a completely closed body when in the raised position, or, when down, to serve as the rear portion of the body and inclose the spare tire or wheel. This double use is obtained by shifting the top bodily from one position to the other on rotating arms fastened to the sides of the car.

When the top is in the lowered position it forms a continuation of the body in rear of the seat, the edges of the top fitting into a recess in the body surface to preserve unbroken body lines. The lower rear edges, resting on a narrow apron formed by flaring the extreme edge of the body, prevent dust or moisture from reaching the inner surface of the top. The design is such as to allow a spare wheel to be mounted in back of the seat, as is done in several cars now being marketed, this wheel being inclosed when the top is down. The general contour of the top is such as to harmonize with the body, and, as the top is enameled to conform to the color scheme of the car, it serves to provide an open car with pleasing body lines.

When a closed car is desired the top is drawn up and forward, being carried during this movement on the side arms. These rotate about their lower ends as a center, while the top is free to swing on the upper ends, allowing it to be maintained in a practically horizontal position. A handle concealed in the upper forward portion of the top serves for raising or lowering the top, and interlocks with clamps to hold the top in either position. The movement of the top is accomplished without alighting from the car. When the top is in the forward position it rests on the body edges, being clamped to the body and to the windshield. If the car is to be completely inclosed, windows carried in the side doors are racked up. A rubber strip pressed into the edges of



The Ellerbeck convertible body

the top all around assures a weather-tight job and prevents rattling of the top in either raised or lowered position. Vision in all directions is provided by windows at the sides and rear.

The supporting arms are turned at right angles at their ends to journal into bearings. The lower ends are connected so as to maintain the arms parallel, and are connected with a spring which is under tension when the top is in the lowered position. This spring relieves much of the weight of the top when it is being raised, and cushions the movement of top in lowering it.

When the body is closed, pleasing body lines are still maintained by carrying the metal of the body sides up and around the spare wheel, as is done with cars mounting the wheel in rear of the seat. Such appointments as inside covering, dome lights, etc., can be used if desired. This type of body is said to be simple and inexpensive to manufacture. It is the design of B. B. Ellerbeck.

A HISTORY of aeronautics, tracing the development of flying craft from the time when the idea was but a dream to its present important stage, has been written by E. C. Vivian, former editor of *Flying*, and Lieutenant-Colonel W. Lockwood Marsh, secretary of the Royal Aeronautical Society. Mr. Vivian takes up the first part of the book with a discussion of the development of flying generally, while Lieutenant-Colonel Marsh discusses progress in design in the second part.

Fatigue of Metals Investigated

University of Illinois report on tests describes materials, apparatus and specimens used in investigation. Results indicate effectiveness of proper heat treatment in raising endurance limit of ferrous metals.

AN extended investigation on the fatigue of metals has been made at the Engineering Experiment Station of the University of Illinois with the co-operation of the National Research Council, the Engineering Foundation and the General Electric Co. by H. F. Moore, Research Professor of Engineering Materials, and J. B. Kommers, Research Associate Professor of Engineering Materials. A report on this investigation has been published, and copies of it may be had from the University of Illinois at a nominal price.

After a brief historical outline of the subject, notes on the organization of the test party and acknowledgments, the report describes the materials, tests, testing apparatus and test specimens used in the investigation. The results of the tests are given in the form of tables and curves; these results are discussed and the following summarized conclusions are drawn therefrom:

(1) For the metals tested under reversed stress there was observed a well-defined critical stress at which the relation between unit stress and the number of the reversals necessary to cause failure changed markedly. Below this critical stress the metals withstood 100,000,000 reversals of stress, and, so far as can be predicted from test results, would have withstood an indefinite number of such reversals. The name **endurance limit** has been given to this critical stress.

(2) In the reconnaissance tests made in the field of ferrous metals no simple relation was found between the endurance limit and the "elastic limit," however determined. The ultimate tensile strength seemed to be a better index of the endurance limit under reversed stress than was the elastic limit. The Brinell hardness test seemed to furnish a still better index of the endurance limit. The reason why the Brinell test and, to a less degree, the ultimate tensile strength seem to be better indices of the endurance limit than the elastic limit is not clear, and this result should be regarded as tentative. Elastic limits determined from compression tests and torsion tests gave no better index than did those from tension tests.

(3) The single-blow impact tests (Charpy tests) and the repeated-impact tests did not furnish a reliable index for the endurance limit under reversed stress of the ferrous metals tested.

(4) Accelerated or short-time tests of metals under repeated stress, using high stresses and consequent small numbers of repetitions to cause failure, are not reliable as indices of the ability of metal to withstand millions of repetitions of low stress.

(5) The endurance limit for the ferrous metals tested could be predicted with a good degree of accuracy by the measurement of rise of temperature under reversed stress applied for a few minutes. This relation is explicable in view of the intercrystalline and intracrystalline slippage under repeated stress shown by the microscope. It is believed that this test, which is a development of a test proposed by Mr. C. E. Stromeyer, can be developed into a reliable commercial test of ferrous metals under repeated stress. Its applicability to non-ferrous metals has not been investigated.

(6) Abrupt changes of outline of specimens subjected to repeated stress greatly lowered their resistance. Cracks, nicks and grooves caused in machine parts by wear, by accidental blows, by accidental heavy overload, or by improper heat treatment may cause such abrupt change of outline. Shoulders with short radius fillets are a marked source of weakness.

(7) Poor surface finish on specimens subjected to reversed stress was found to be a source of weakness. This weakness may be explained by the formation of cracks due to localized stress at the bottom of scratches or tool marks.

(8) Stress above the endurance limits, due to either a heavy overload applied a few times or a light overload applied some thousands of times, was found to reduce somewhat the endurance limit of two ferrous metals tested.

(9) In none of the ferrous metals tested did the endurance limit under completely reversed stress fall below 36 per cent of the ultimate tensile strength; for only one metal did it fall below 40 per cent, while for several metals it was more than 50 per cent. However, these metals were to a high degree free from inclusions or other internal defects; the specimens had no abrupt changes of outline and had a good surface finish.

(10) It is well known that subjecting steel to a stress beyond the yield point raises the static elastic tensile strength to a marked degree. The effect is less marked on the endurance limit, although some increase was observed for 0.18 carbon steel with the surface polished after being stretched well beyond the yield point. Annealing of commercial cold-drawn screw stock was found to lower its endurance limit somewhat less than it did its static elastic strength.

(11) The test results herein reported indicate the effectiveness of proper heat treatment in raising the endurance limit of the ferrous metals tested. Here, again, it should be noted that an increase in static elastic strength due to heat treatment is not a reliable index of increase of endurance limit under reversed stress.

(12) The phenomenon known as "fatigue" of metals under repeated stress might better be called the "progressive failure" of metals. The most probable explanation seems to be that such failure is a progressive spread of microscopic fractures. A nucleus for damage may be a very small area of high, localized stress, due to a groove, a scratch, or a crack; in other cases failure may be due to internal inclusions or irregularities of structure; it may be due to internal stress remaining after heat treatment; it may be due to a grain or group of grains unfavorably placed to resist stress; or failure may begin in the weaker grains of a metal whose structure consists of two or more kinds of grains; or it may, of course, begin in any portion of the metal which, by accidental overload or otherwise, is stressed to the yield point.

Recommended Seating Dimensions for Passenger Car Bodies

A discussion concerning various controlling dimensions which require consideration in laying out the seats and other closely related portions of the modern body. The author recommends the standardization of a range of locations for control elements and gives average dimensions.

By George E. Goddard*

BODY seating dimensions vary. Naturally, we do not all agree upon what constitutes the most comfortable chair; if we did, we might all be buying the same chair. Therefore, body seating dimensions are not a subject for standardization; they can, however, be given very serious consideration and the intention of this paper is to elucidate certain necessary features conducive to comfort.

Cushion Height, Depth and Slope

The mode of women's dress is of prime importance. It is very fortunate for the body designer that women are wearing shorter skirts at present, and that they girdle themselves with a support of minimum proportions, particularly as to vertical dimensions. Seat cushion heights are now, or can be made, as low as is necessary to secure the assumption of a comfortable sitting position, or to arise from that to a standing position; in other words, it is necessary that the passenger be able to sit down and to arise easily and naturally.

I will call the space in front of the seat "leg room." Naturally, this space must be increased to conform to the lowered sitting position. It is here that one of the greatest variations in seating dimensions occurs. When this leg-room is restricted, the final position must be made comfortable by incorporating the proper slope in the cushion and the corresponding slant in the seat back. It has been stated that the semi-reclining position attained in the deck chair, so common on ocean liners, is ideal. This may be entirely correct, but I doubt if it can be duplicated in conservative motor body design. However, it can and should be approached in the passenger car, because it contributes to the attainment of a horizontal line of vision that is more nearly equal in elevation to that of an individual who has assumed a standing position. The more nearly the eye line height of the passengers is brought to that of a person who is walking, the more they will be at ease, if for no other reason than that man's work is carried out mainly from this viewpoint.

The depth of the cushion, from front to back, is affected by both the height and the leg room. If the latter is not restricted, the slope can be made slight and the depth greater. If it becomes necessary to draw the legs back, the knees are raised and the body must be supported by the cushion at a greater slope. In coming back, the calves of the legs would interfere with the front of the cushion and it must be made more shallow. The seat back must be slanted more, the back springs slightly stiffened and the "foot rest position" located within comfortable reach. These seem to be the elements to be given major consideration. I recommend 12 in. at the front of the cushion as a good compromise position, with a minimum depth of 17 in. on a 2-in. slope and a minimum back height of 17 in.; also, for the rear seat, a 14-in. height at the front of the cushion, with a minimum depth of 19 in. on a 2-in. slope and a minimum back height of 19 in. These dimensions are, of course, dependent upon the pedal position from the front edge to the cushion of 19 in. and a foot rail position of 18 in., measured correspondingly, and reference is made to the illustration and last line of figures in the tabulation. It has been found preferable to have rear seat passengers ride slightly higher than those in the front seat, to secure clearer forward vision. The 2 in. recommended, when combined with the slope of the chassis, which should be from 1 to 2 in. with a full complement of passengers, is sufficient under average conditions.

Upholstery Shape

To deviate for the moment from the actual dimensions of seats, the correct shaping of the seat, the upholstery contour, is of far greater importance than either its proportions or softness. The dimensions may be such as to provide a well proportioned seat, and yet it may be a very uncomfortable seat for even a short ride. The angular relation of the cushion and the back upholstery must be right. This relation will vary somewhat with the height of the cushion and the foot rest position, but the angle will average about 95 deg. The cushion should have an approximately flat slope, but the back upholstery shape must have a properly curved contour. This contour naturally does not vary to a great extent as to characteristic shape regardless of the height, depth or slope of the cushion, or the height of the back upholstery itself. It is obvious that the occupant's back must be supported, but proper support is lacking in a great many seat backs. If, when seated, one's back can "cave out," there are very few who can ride 10 blocks in comfort; but, if one's back is properly supported against curvature, one could drive or ride for a four day 1000-mile trip and feel sufficiently fit at the finish to turn around and do it again. Strange to say, the average trimmer fails, without considerable coercion, to produce this desirable shape, and particularly a properly graduated resistance to prevent curvature. The back upholstery must be shaped so as to have a prominence of the proper resistance, and be at the proper height from the cushion to fit the small of one's back. It must, nevertheless, taper off toward the top to provide ample shoulder freedom. This is particularly important for the person at the wheel. The resistance at this point can be fairly stiff and yet be comfortable. In fact that supposed 1000-mile

*Slightly condensed from a paper presented at the Annual Meeting of the Society of Automotive Engineers. The author is assistant chief-engineer of Dodge Brothers.

ride depends upon making it stiff. There should be very little movement of one's back at this point; the movement should occur at the hips. The driver needs this resisting prominence in particular, to enable him to attain a confident and comfortable operation of the clutch and brake pedals, if for no other reason. Without attempting to give details of the layout of this shape, I would say that the gradation of the springs of four row backs can be made so that the bottom row has No. 13, the main row No. 12, the third row No. 13 and the top row No. 14 springs. However, this can all be laid out on paper. From this, drawings and specifications of the back spring constructions, as well as of the cushion, the back and the final inspection templates, can be determined.

Softness of trimming is controlled to a great extent by the trimmer but, if the final contour of the combined cushion and back is obtained, together with a properly related foot rest position, the slight variation occurring as to softness is inconsiderable. If it is to be featured, softness should be obtained in the spring construction almost entirely, especially in the straight pleated type. The cushion top should be firm, to enable it to endure for a proper length of time.

Position of Foot Rest, Steering Wheel and Controls

The term "foot rest position" has been used as applying to the brake and clutch pedals and to the foot rail. It applies, also, and perhaps more particularly, to the accelerator pedal. It is obvious, then, that the last named should be located at a slightly greater distance than the other pedals for, when operating clutch or brake, sufficient freedom of movement between the thigh and the cushion must be allowed for, when determining the slope of the cushion. Since the accelerator pedal has less effective travel, it must be positioned to take up practically all of this freedom in order that the thigh be comfortably supported along the entire length of the cushion slope. An accelerator pedal toe rest cannot accomplish this; it can merely produce ankle comfort. The height *H* of the pedal pads from the floor, as shown in cut, is a dimension that deserves much study. How the improper position of some of the existent pedal pads has been arrived at, is a mystery. I suggest that the Society formulate a diagram of control dimensions locating pedal pads, lever grips, the handles and knobs on the instrument board, and the like, from the center of the bottom of the steering wheel rim. The height of the foot rail *L* should be such that the front of a man's shoe heel can be braced underneath the lower edge. This height will then be such that the ball of a woman's foot will usually rest on the center of the rail. The slope of the toe board should be approximately at right angles to the calf of the leg, located so that the thigh rests along the entire length of the cushion slope and within comfortable reach. The sitting position should be determined properly, regardless of the control.

It has been shown how the pedals should be located in relation to the seat. The steering wheel and hand levers should be treated in the same manner. I recommend a minimum distance below the wheel of 8 in. and a space of 15 in. to the back upholstery, as indicated by the letters *I* and *J* in the illustration.

The arm rest position also must be given due consideration. On open cars, the height of the body side properly should be determined from this viewpoint, unless the seat width is sufficient to provide a built in arm rest. A minimum of 9 in. is recommended.

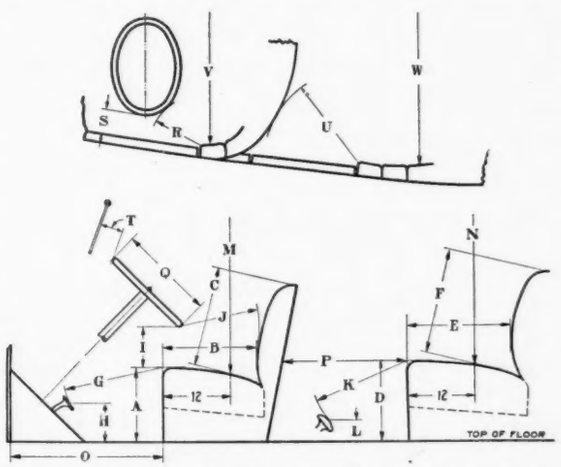


Diagram of body, showing dimensions which influence design and location of seats. See accompanying table for dimensions corresponding to letters used on this cut

Head Room

Head room is a fairly well established dimension. Where the door width is ample and the running board is positioned properly, the entering and leaving of the car is accomplished without assuming even a stooping position. The head room at the front seat can be less than that at the rear, being between axles. The greater range of chassis spring action at the rear makes it advisable to provide slightly more head room over the rear cushion. The minimum to be recommended for the front seat is 37 in. and, for the rear, 38 in., measured vertically at a point 12 in. back of the front edge of the cushion and 8 in. from the side of the body, as indicated by the letters *M* and *N* in cut. Although but 36 in. has been provided in some bodies, this dimension generally is accompanied by an unusually soft cushion.

The entering and leaving of the car has been mentioned in connection with door widths and the like, but the actual clearance between the parts of the structure is the true viewpoint to assume for such considerations. For instance, the distance between the corner of the front seat, or a curved partition, to the rear door hinge pillar must provide a comfortable "hip clearance." A minimum of 17 in. is recommended, as indicated by the letter *U* in the cut. This dimension will provide sufficient shoulder clearance, although more room than this is desirable, particularly if the door is hinged on the front pillar. For entrance to the front seat, "shoulder clearance" should be considered in connection with the slanted windshield or body front. When using the wheel side for entering or leaving the car, ample leg or "body clearance" should be provided between the wheel and the seat arm or front door rear pillar. A minimum of 9 in. is recommended for open bodies, as indicated by the letter *R* in cut. This should be slightly greater on closed bodies and in both open and closed types, where the front door is hung on the rear pillar. Of course, where the body space is limited, this can be accomplished with the aid of a sliding or tilting steering wheel.

Seat Width

The width of seats varies from 37 to 42 in. for front seats, as shown in the tabulation herewith. This dimension is determined more by body design than from the standpoint of proper space for two passengers. While 16 in. of cushion space is sufficient for the average person, a minimum shoulder space of 18 in. should be allowed for passengers. For the driver, I prefer to provide a 21-in. shoulder space to allow ample freedom of arm movement. A front seat width of 40 in. will satisfy these requirements and, with the steering column 10 in. from the center line of the car, the driver will be able to sit directly behind the wheel. It is true that many bodies can be found that are narrower at this point, but too sudden a contraction cramps the left arm movement of the driver. The inside measurement of the body, taken

Table of Dimensions Which Influence the Design and Location of Seats.

O	11	16	17	12	18	18	17	6	6½	14	16	3	36	37	28	21	17	9	4	3	16	38	45	
No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	WB
1	11	16	16¼	14¾	19	18	18½		6¼	15½					31	25					16½	38¼	46	112½
2	12½	17	17½	15	19	18	18		7½	14					31	22					16	38	45	112½
3	15	18	18	16	19½	19	17		7¾	15½					29¼	21						42	47	115½
4	13¼	16	15½	12½	19	17½	17½		7½	13½					32	23						42	46	112
5	15	16	16¼	15	16	19	17		7	14½					28½	21						40	47	115¼
6	14½	18	16	16½	17½	17½	16½		8¼	15					30	25						39	45	118½
7	15	17	15½	16	18	17½	16		7	14½					29	22						40	46	115
8	11	19	16½	14	18½	18	19									23½					15¾	37	38½	113
9	13	17	18½	14	18	17½	18¾		7½	15½					30½	21⅛					17½	40½	43	108
10	13	15½	17¾	14¾	17⅞	19	19		8¼	14					31⅜	21¼					15½	41	46	113⅛
11	12	16	17	14¾	17⅞	19	20		7⅝	14½					31⅜	23¼					16	41	46	116
12	12½	18	19½	15	21	21	22		8¾	16						19¼					18½	2 Seat 17.5	45	142
Average	13 1/16	16½	16.8	14 1/16	18	18 3/16	17 11/16		7 11/16	14⅝					30½	22½					16¼	39⅞	45	113 11/16
*	12	17	17	14	19	19	19	7	8	15	18	4	37	38	30	24	17	9	5	4	17	40	47	

varies 6 to 9 | varies 17 to 21 | varies 3 to 4½ | varies 36 to 38 | varies 37 to 40 | varies 16 to 20 | varies 8 to 12 | varies 4 to 8 | varies 3 to 10

Dimensions for "Average" do not include No. 12.
O = Minimum practical. } Each dimension in these two lines is given as an individual
* = Minimum recommended. } minimum. Combinations of some dimensions not feasible.

across the center of the steering wheel, should not be less than 45 in. The space *S* will then be but 4 in. when a 17-in. wheel is provided on a column in the location already stated, as shown herewith. I have driven cars that it hardly would have been safe to have driven in congested traffic or in unusually bad going if the front window had not been lowered or the door curtain left off. Cramping at this point should not be encouraged, at least. The hand clearance between the wheel and the windshield should not be less than 3 in., although this depends somewhat on the rake of the steering column of course. The width of rear seats, as shown in the figures for 12 cars tabulated, averages 45 in. for three passengers. It is preferable to provide, as nearly as is possible, a 16-in. cushion space for each passenger.

Depth of Front and Rear Compartments

The distance between the front cushion and the dash, 30 in., usually is ample and does not vary to a great extent, as is shown in the tabulation of the dimensions. The space provided between the rear cushion and the back of the front seat is determined by the use to which it is to be put. With the rear cushion in the compromise position recommended in the first part of this paper, the minimum distance should not be less than 21 in. If ample space for wearing apparel carried on the robe rail or room for a traveling case is desired, it will be necessary to increase this dimension, but 24 in. gives a comfortable compartment.

Knee-room to the front and rear of folding seats in seven-pasenger bodies or bodies having staggered seats should not be less than 26 in., measured from the back upholstery to the part of the structure in front. Therefore, allowing 1 in. for the thickness of the folding seat back, the distance from the back upholstery of the stationary seat to the structure in front should not be less than 53 in.

Standardization of Control Dimensions

In conclusion, I wish to make another plea for the standardization of a range of locations for the control elements as outlined, and also to suggest that a manikin be developed to conform to the average dimensions of the human body, so that it can be used as a standard from which to work. If this accomplished nothing more than the discouraging of such proportions as are found in some of the bodies shown at one of the recent foreign shows, it would be well worth while.

Austria Demands Import Payments in Gold

THE Austrian Government recently enacted an order demanding payment of import duties on certain articles in gold. Included in the list of these articles are the following automotive products:

Tariff Number	Designation of Article	Duty for 100 Kilograms in Kronen
553	Automobiles, also dismantled, and complete chassis with a weight for the piece of:	
	a. Up to 400 kilograms	150
	b. More than 400 up to 1800 kilograms	120
	c. More than 1800 up to 3200 kilograms	100
	d. Over 3200 kilograms	60
	Motorcycles belong to the same tariff number as automobiles.	
320 e.	Pneumatics (tubes and covers)	150

Motor Bus Becomes Vital Transportation Factor in This Country

There are 450 regular bus lines now operating in this country, according to the best available figures. This article traces the growth of bus transportation, gives a picture of the present situation, and points out the part to be played by the truck manufacturer in developing a great potential market. Progress in design an important factor.

By Sinclair Gluck*

JUST as the automobile had reached a high efficiency of design before the motor truck began to develop, so the motor truck had attained a wide variety of design, of model and of use before the motor bus was seriously considered as a nation-wide transportation factor.

The available production capacity of the motor truck industry, together with the experience in design possessed by motor truck engineers, makes the motor truck manufacturer the logical builder of vehicles for bus transportation. The potential possibilities of the bus field are rapidly becoming more widely recognized, and the picture of the wide development in England recently given by Walter Jackson in AUTOMOTIVE INDUSTRIES served to visualize the possibilities of development in a general way.

The truck manufacturer, however, is naturally interested in the domestic market; in the actual sales possibilities, as well as in the long range view of bus development. With this thought in mind, it is pertinent to examine at this time the present status of the motor bus in the United States, the lines along which its development has taken place thus far, and the probable future which lies ahead.

Accurate figures as regards the number of motor buses operating in this country are not available at present. This is due partly to a lack of definition of terms and partly to lack of proper registration facilities. An estimate can be made, however, accurate enough to give some picture of the present scope of bus development.

20,000 Buses in Operation

The N. A. C. C. estimates that there are 20,000 motor buses operating in the United States at the present time. Numerous regular bus lines have been developed in various parts of the country, and the most recent estimate compiled by *The Commercial Vehicle* shows that there are about 450 such lines. These figures do not include jitneys or similar hindrances to sound motor bus development. With these figures as a background the field can be examined more specifically as regards mechanical probabilities and commercial growth.

The original truck was simply a goods body on a passenger car chassis. Later the developments of the truck were, for the most part, developments of passenger car parts with a special eye to truck requirements in the new field of the latter. In the same way, the original bus was and for the most part still is a bus body mounted on a truck chassis. Such changes as have been made up to date are, for the most, developments of truck parts with a special eye to bus requirements.

At present, the special bus chassis is in an experimental stage. With certain exceptions the manufacture of buses has been in the hands of the truck manufacturers and the sale of buses has been a side issue of their business. Naturally, the manufacturer has sold the chassis which he has on hand rather than design a new model for bus use. In some cases the truck chassis has proved serviceable for bus use. In other cases it has not.

To some extent the truck manufacturers have experimented with a wider, lower chassis for bus purposes and with other variations from the truck chassis. But parallel with the manufacture and sale of truck chassis, or slightly modified truck chassis, for bus purposes, has been the development of an ideal bus chassis by the bus interests.

Fifth Avenue Type

The biggest and best known bus company in the United States is the Fifth Avenue Coach Co. Back in 1904 R. W. Meade, who was at that time president of the Fifth Avenue Coach Co., went to Europe and selected the DeDion-Bouton bus chassis. This design was used by the Fifth Avenue Coach Co. until 1915 when the company began building its own buses, for its own use. This model had practically the same design in chassis, gearbox and clutch as the DeDion-Bouton. And quite recently this big bus company has announced the fact that it is now manufacturing buses for sale to other companies.

Although the bus is still closely linked with the truck as to chassis, it has developed more extensively along its own lines as to types of bodies and capacities of bodies.

The different types of motor buses now in use on the streets and highways can be divided roughly into three classes. First, the highly specialized big double-decker for use in big cities, where the traffic justifies a carrying capacity of 50 passengers or more. Second, the smaller, single-deck bus for crosstown runs, for urban and interurban runs, for use as street car line and railway line feeders and for hotel-depot work. And, third, the sightseeing bus.

At present the first type of bus is in use in only three cities in the United States, although it is used much more extensively in England. The Fifth Avenue Coach

*Managing editor, *The Commercial Vehicle*.

Co. operates 265 buses of this type in New York City. These buses accommodate 44 and 47 passengers. The Fifth Avenue Coach Co. has recently installed a new type of bus which is lower built and which accommodates 51 passengers. The Chicago Motor Bus Co. operates 50 double-deckers in Chicago. This company has also added a new type of double-decked bus recently with the upper deck inclosed. The older type accommodates 51 passengers; the newer type, 60. Finally, the Detroit Motor Bus Co. operates 70 double-deck buses in Detroit. These buses accommodate 48 passengers each.

The second class of bus is much the largest. It includes vehicles of capacities ranging from 12 up to about 30 passengers. The bodies of these buses vary in arrangement, some having cross seats like a railway car, some having forward and aft seats like a closed street car and some being equipped with a combination of these two types. In this class of vehicle there are variations of design also. The vast majority of this class of bus for public passenger service are one-man operated vehicles, with the entrance and exit door on the side, near the driver's seat. The fore and aft type of design seems most popular, especially for work in districts where traffic is heavy at certain hours, because this arrangement of seats leaves more standing room.

The third type of bus, the sight-seeing bus, is usually an open vehicle, with the seats running from side to side and with doors on either side for each seat. These are built to accommodate from 20 to 40 passengers. They are used in large numbers in New York City, in Washington, D. C., and in California. But a good deal of jouncing and discomfort to passengers is one of the drawbacks of a motor bus body extending far beyond the rear wheels. And the sight-seeing bus is usually of this type.

The Sphere of Usefulness

The sphere of usefulness of the motor bus is already an extensive and a varied one.

The motor bus has its place in the large city where it can supplement street car and underground transportation and relieve congestion.

It has its place in the small town, where it can supply transportation facilities to passengers too limited in number to justify the installation of a street car line.

There is a big sphere for buses in suburban districts, both as transportation lines to and from the shopping and marketing districts of the nearby city and as a supplement to street car lines. In the latter case the buses act as feeders, bringing the passengers from outlying districts to central points, where their numbers make a street car line a paying proposition.

Finally there is the interurban field, where bus lines connect small towns in a net-work of transportation. This is a peculiarly valuable field for buses, because there are many such towns from and to which there is too little passenger travel to justify the more expensive installation of an interurban trolley line.

Lastly, there is an interurban field for the bus in connection with freight transportation. This is shown by the success of the Tidewater Lines in southern Maryland. This concern operates both buses and trucks, taking care of both passenger and freight transportation throughout a big territory heretofore served by no modern transportation system.

Like the truck, the bus has proved and is proving a national asset. It, too, has made for better roads, because it cannot operate efficiently over very poor roads. And by linking up isolated districts with towns and cities it has increased land values of sites for suburban homes and has brought many shoppers to the towns. This in turn has increased sales and industry generally in small towns and cities, by bringing to the shopping districts outlying settlers and farmers who previously ordered their purchases from big mail-order houses—or went without.

Curiously enough, buses will also have a considerable future influence upon education, an influence which is already making itself felt. In rural districts where there were no transportation facilities, we formerly had tiny rural schools dotted over the countryside, sometimes a school to each village. This meant a multiplicity of teachers, who were poorly paid and accordingly inefficient. But bus transportation has promoted and is still promoting the larger rural school, centrally located, to which school children are brought by bus from all the surrounding districts and villages. This means fewer and better teachers and better education in consequence.

The Bus Will Supplement, Not Supplant, the Street Car

The bus can never replace the street car altogether, for its function is to supplement, not supplant, the street car. But it has had a salubrious effect in several instances in improving street car service through competition. The passenger transportation of the United States, for short haul work, is still in a fluid state. When it solidifies, the street car line and the bus will each have a place and a clearly defined place. In the meantime, there is competition. This has meant a certain amount of confusion, friction and duplication of effort. But the effect of bus competition on street car lines has been good rather than bad in that it caused street car lines to improve their service in many instances in their fight to retain their place in the public regard, and gave the public a new idea of transportation.

In many instances the bus has also relieved congestion and real hardship for the traveling public.

The principal advantages of the bus, in comparison with the street car, are two: Cheapness of installation and flexibility. In certain districts and under certain conditions, these are outweighed by the advantage which the street car possesses, in its ability to carry more passengers. But in other instances the advantages of the bus outweigh those of the street car. And in these last the bus will eventually be established.

This fact has led to an interesting development. The street car lines in certain districts, unwilling to give up their overhead wire installation, but recognizing the advantage of flexibility, are installing trackless trolleys. These are buses mounted on pneumatics but operated by electricity from an overhead trolley.

Overhead Trolley Bus and Flanged Wheel Bus

These installations have been tried out in various parts of the United States and England, notably in Teesside and York in England and in Staten Island, N. Y.; St. Louis, Mo., and Richmond, Va., in the United States. Where the overhead wires and power houses are already installed, these may be cheaper than gasoline buses to operate, although if depreciation on this equipment is taken into consideration, even this is doubtful. But the principal argument against this type of equipment is that, while it permits a certain amount of flexibility in passing other traffic and can drop its passengers at the curb instead of in the middle of the street, it is still tied, by the overhead wires, to a certain route. Thus a parade or a fire can tie it up like the street car. And a shifting or a development of population can leave it high and dry like the street car.

Another interesting development and one which has taken exactly the opposite tack is the flanged wheel bus, designed to operate on tracks. In certain cases this also

has its value, in that it is cheaper to operate than a train of cars and can take care of the passenger and freight traffic on a little used branch line railway with a short run.

In the opinion of the writer, both these developments will be restricted in their use and while they have their value in isolated instances, they will not be of material influence on the transportation problem.

The future of the bus in transportation has already been indicated by its present development. Such further development as there will be will probably be along the lines of better design rather than of different use. The bus will be more extensively used than at present, but it will be used in much the same way as at present. Future changes will be changes in design rather than in application.

In the opinion of the writer, the average truck chassis is not ideal for bus work. The truck chassis is too high. It has too short a wheelbase and too narrow a tread. And a better spring suspension for bus purposes can and will be designed than that with which trucks are now equipped and which is highly suitable to truck work.

It is interesting to note the opinions of automotive manufacturers themselves on this subject, and on the subject of future bus business in general.

A prominent motor truck axle manufacturer writes as follows: "We believe that the volume of motor bus transportation and its possible expansion are tremendous, and will grow with the increase of good roads until we have intertown connections between all of the more important towns and villages in the country.

"We believe there will be, in a general way, three types of buses: One for strictly city use, with low, wide bodies and second stories; larger intercity buses of about 30 to 36 passenger capacity; and smaller buses for intertown or town work in small communities, this last type to have a capacity of from 12 to 16 passengers.

"There are certain changes in chassis design necessary and the present types of motor truck chassis are not satisfactory in their entirety for motor bus work. The motor bus must be built closer to the ground, with a liberal width of body and a better spring suspension. The high speed pneumatic work places a greater strain on all of the units entering into the construction of the bus than is the case in the ordinary motor truck, and in designing motor buses this must be taken into consideration, as well as construction which will enhance the safety of the passengers. For instance, in the axle construction more generous brakes must be provided; and axles of the full floating type should be used so that shaft breakage will not endanger the lives of the passengers."

A letter from the Pierce-Arrow Motor Car Co. may be quoted on the question of speed, etc.: "We are thoroughly convinced that the future of the motor bus is positively assured and this fact is based upon the investigations which we have made concerning the use of buses by the steam and electric railroads and also private transportation companies. In each instance where buses have been installed the results have far exceeded our expectations. The buses which we installed at Albany are in operation 17 hours a day consecutively and each bus handles between 750 and 1000 people at a 6-cent fare.

" . . . We feel that a speed of 25 miles an hour is all that is necessary to handle any city traffic, and if such a speed is used in suburban districts, the same volume of people can be handled at a far less depreciation of the vehicle."

Fuller & Sons Manufacturing Co. make some interesting points: "We believe that in the smaller cities up to 40,000, bus service will predominate, but as cities grow larger there will be both buses and electric service. . . . There is a great future for the motor bus in intercity runs. . . . As the bus lines prove their stability there will be a greater number of city people who will have their homes in the outskirts of the city, as in instances where interurban lines run out from the cities."

On the subject of future bus types, the Walker Axle Co. has this to say: "The future motor bus resolves itself into two general types, according to our estimation: One, the large bus carrying approximately 55 passengers, possibly double-deck, to handle traffic in thickly populated districts where short-haul, frequent-stop business will be found; the other, the general type, will be the light, high-speed bus with possibly 20-28 passenger maximum capacity, equipped with pneumatic tires, to handle express service in the city, rural school service and intercity service. **In both these types of motor bus the equipment will certainly have to be of special design.**

"In the case of the large bus, axles will have to be of such a nature that the center of gravity of the truck unit will be brought as close to the ground as possible. The tread or track of the axle will have to be considerably wider than at present."

According to Walter E. Parker, president of the Commerce Motor Car Co.: "The fast growing use of motor bus transportation gives promise of phenomenal development during the next few years. These years will see the foundation of fortunes laid that will compare with those which accompanied the development of the interurban traction lines."

This general picture of the motor bus situation in the United States, coupled with the recent survey of the British development will visualize for the truck manufacturer the scope of this field. There is an immediate market of limited proportions and a future market of wide proportions. The rate of growth will depend to a large extent upon the progress in bus design, and the marketing methods of the manufacturer.

Motor Fuel from Waste Materials

PROSPECTS of adding materially to the supply of liquid fuel from the manufacture of alcohol from British-grown sources are remote, says a report by the Fuel Research Board of England. Reference, however, is made to experiments in the growing of Jerusalem artichokes, and it is suggested that a scheme of co-operative farming, including dairy farming and pig keeping, combined with the manufacture of alcohol and cellulose, might be a means of relieving the fuel situation, reclaiming waste lands and increasing the food supply.

The report continues that research work for a process, chemical or bacteriological, to produce alcohol commercially from waste vegetable materials has not yet reached a stage where its possible industrial application can be practically considered; the discovery of such a process, however, where locally applicable, probably offers the best chance of a large scale production of power alcohol.

The report is the result of a questionnaire dealing with the possibilities of producing alcohol within the British Empire for use in internal combustion engines.

Economic Problems of Highway Construction

The highway engineer must have a broad knowledge of the various economic factors in order to design efficient roads. Relative proportion of heavy and light loads to the traffic is an important factor. Greater cost of a stronger road must balance against low operating cost of heavy trucks.

By H. S. Fairbanks*

TO one familiar with the history and interested in the future of American highway building there is nothing more reassuring—nothing which seems to give better promise of healthy development—than the general recognition of the existence of numerous problems which remain to be solved. At a time not so remote as to be beyond the span of a young man's experience it would have been almost heresy to doubt that the last word had been spoken on the subject of highway design and construction. Highway builders were sure of themselves then—sure of their principles, at least, and their main efforts were directed to the standardization of practices to conform to this or that method which had been found successful.

Knowing very little of how they did it, road builders of that day were yet able to build to the full satisfaction of the traffic of the time, a horse-drawn traffic that moved on steel-tired wheels. Then came the automobile to jar the universal complacency and later the motor truck to shatter it to bits, with the war's intensified heavy traffic to grind the bits to powder, then for a season hopelessness, when engineers saw their best roads utterly demolished by trains of army trucks without an idea as to how they were to be replaced.

Big Problems to Be Solved

Then came the dawning of the realization that there were some highway problems to be solved, some big problems that go to the very fundamentals of highway engineering. To the Bureau of Public Roads came the first realization of the bigness of these problems, and it set to work immediately to gather the facts necessary to place highway construction upon a more scientific basis. In this work the bureau has been followed by many of the State highway departments and by the laboratories of a number of universities. At first the researches of the various agencies were carried on along the lines which appeared to each as the most desirable, and there is no doubt that some of the ground has been covered by more than one investigator with resulting waste of effort. This condition should now be remedied through the instrumentality of the National Research Council, which is undertaking to correlate and co-ordinate the work of the several agencies, parceling out to each a definite part of the whole, and knitting together the results of their labors to form a complete fabric of scientifically obtained fact.

The researches in which the greatest progress has been made have dealt principally with the physical problems involved in the design of the roads. But even more important than some of the physical problems are those of an economic nature which condition the character of the physical construction. By far the majority of considerations influencing the location and type of the road are economic and not physical considerations.

Character of Traffic

Thus one of the first things that must be known before any highway can be intelligently designed is the character of the traffic it will carry. In this respect the railroad engineer has a comparatively simple problem. The traffic he prepares for is more or less definitely predictable. But for the highway engineer the future is cloaked in uncertainty. This much he can be reasonably sure of, the traffic of the past is no sure index of the traffic of the future. The past use of the road has been governed by its physical condition. When its physical condition is altered the traffic which uses it will change.

For purposes of design the engineer must know both the approximate volume of the future traffic and the weight of the heaviest vehicle. Knowledge of the volume of traffic is needed principally to determine the width of the road, the attrition of the surface, a function of volume being practically negligible when the large majority of vehicles are rubber-tired. The maximum vehicular weight is required to determine the strength of the road's surface. In this determination volume plays an important part. It is possible that the repetition of maximum loads may serve to fatigue the road structure and cause it to break down under a load which it would carry safely if applied only occasionally. But, broadly speaking, the road must be designed to carry the heaviest load that will be applied to it, whether that load is applied few or many times.

If this were all the information required, therefore, the economic problem would not be difficult. We could assume with practical certainty that every road—no matter what its location—would occasionally have to carry the heaviest vehicle manufactured, and, since the policy of vehicle manufacturers is to restrict the weight to a standard maximum, this would not be difficult to determine. As volume of traffic (assuming that it is rubber-tired) has practically no effect upon the design of the surface except as it concerns width, the conclusion would necessarily be that all roads must be constructed of equal strength and that the only permissible variation is in their width.

Such a conclusion, while entirely consistent with the physical requirements of unregulated traffic, fails to take account of all the economic facts. Large, heavy vehicles

*Senior engineer, Bureau of Public Roads. Slightly condensed from an article printed in *The Washington Engineer.*

are used in preference to small, light vehicles because their relative cost of operation is lower. One hundred tons transported in five-ton vehicles will be moved at lower cost than if it is carried in one-ton vehicles; but to operate the heavier vehicles requires a heavier and more expensive road. The economic problem, therefore, is to balance the greater cost of the stronger road against the lower operating cost of the heavier vehicle.

To determine how much more can be economically expended to build a road for traffic of five-ton instead of two-ton vehicles the saving in cost of operation per ton-mile must be multiplied by the number of ton-miles carried during the year, and the result will be an annual saving in operation which, capitalized, is the amount that can be spent to strengthen the road to carry five-ton instead of two-ton vehicles.

It must be evident, therefore, that if only a few of the heavier vehicles use a given road, the saving in operating cost by their use cannot be sufficient to justify the additional expense of the stronger road, while if the traffic of such vehicles is large, the saving may more than offset the greater construction cost. It appears, therefore, that the facts with regard to traffic that must be known before any intelligent decision as to the type and dimensions of the road can be reached are as follows:

1. The maximum weight of vehicle.
2. The volume of traffic.
3. The relative proportion of heavy and light loads in the traffic.

It is this last-named fact that is difficult to determine in advance of construction. In its unimproved condition it is likely that the road has been used by but few heavy vehicles, simply and solely because of its condition. When the condition is improved the chances are that the number of large vehicles that will be operated over it will be increased. How great will be this increase and what expenditure for road improvement will be justified by it is the road builder's problem.

Unfortunately the uncertainty goes deeper than the mere question of first cost. Supposing that it be decided upon purely financial considerations to build 30 miles of a given road outward from a city as a five-ton road. For that distance, let us say, it is anticipated that the road will carry a sufficient number of five-ton vehicles to justify the construction of the five-ton surface. Beyond the 30-mile point such a showing cannot be made, and it is decided to provide for vehicles no heavier than three tons. What, then, is to be done about the occasional five-ton vehicle which it is desired to operate to the town or village 60 miles from the city? Is its operation beyond the 30-mile point to be prevented by police regulation? Then we must take into our financial computations the cost of policing the junctions of heavy and light traffic roads. The strict enforcement of such a regulation will mean one of two things, either of which will add to transportation costs. Either the cargo of the heavy truck must be trans-shipped to a lighter vehicle at the junction of the light traffic road or matter destined for points beyond the junction will have to be shipped all the way in light trucks. Which way does economy lie?

The question will never be definitely answered except in connection with the special conditions surrounding each case, but there are a number of general questions, which will arise in every case, which deserve immediate attention by those who are working to solve the newly recognized highway problems. Such matters as the operating cost of motor vehicles; the economic motor truck haul in competition with steam and electric and waterway transportation, and in the absence of such competition; the highway traffic contributions of the principal industries; the relation of cities and the distance between them to the character of highway traffic—these are matters requiring general study for application to particular cases. In view of their manifest importance it is difficult to understand why they have not already received the careful, scientific study that is being given to the solution of the more important physical problems.

Trucks and Tractors on the American Desert

IN this period of slow movement of tractors and careful buying of motor trucks, a new, and promising field, of an area equivalent to almost one-third of that of the United States, has just been opened to the manufacturer, salesman and demonstrator. This is the American desert, especially that part of it which lies in Nevada, Utah and California. Part of this opening up of the Great American Desert, especially at its northern end, is due to the plans of the new $25,000,000 coal, coke, iron and steel merger, which is combining the raw materials of Utah's mines, with the steel mills on the Pacific Coast. Another important factor in the introduction of motor trucks and tractors to the desert has been the West End Chemical Company of Oakland, Cal. This corporation, which has just discovered a mountain containing 300,000 tons of Colemanite (borate of lime), has been able to develop its property, carry its crystalline ores to the mills and to the railroad, solely through the operation of a fleet of road tractors, tractors and motor trucks. Through its example, other mines in this section, which have been unable to reach maximum production, and, very often, any production at all, by means of mule-drawn transportation, are turning to the truck and the tractor, especially the road tractor, following the example of the West End Chemical Company.

The road tractor, with its steel wagon trailers, has completely driven the 20-mule team and the largest wagons in the world from the trails of the desert, and it remains for the truck and tractor builders and the transportation and distribution engineers to fill this field with their automotive vehicles. Development of this area would also bring transportation to the vast deposits of ores in this desert, which are now dormant because of lack of this very transportation and distribution system and means.

Saving Russia with Tractors

A SIMPLE, though somewhat bold and costly plan to help save Russia was presented recently to the International Labor Conference at Geneva. It involves sending great fleets of tractors into the vast grain districts of that country, with men qualified to teach the Russians how to run them.

Undoubtedly this plan would do a great deal towards restoring the wealth of Russia, for development of her farming lands will accomplish that result. Conditions there are not exactly such at present, however, that the American manufacturer is willing to invest any large sums of money in any industry there, but such conditions cannot last always. There will come a time when Russia will become a factor in world commerce, and when that time appears it would be a good idea for American tractor manufacturers to be ready to step in and do their share in redeveloping the vast farming areas, and incidentally make a profit for themselves.

Chicago Show Indicates Return to Stability

(*Continued from page* 214)

new straight-line flat cowl, flat hood type of line which seems to be rapidly gaining favor. The steel disk wheels blend very harmoniously with this type of line. The car is low so that the driver's eye is about on the same level as if he were walking along the street. The car weighs 2400 lb. and carries a 3⅛ by 4¼ six-cylinder engine. It is mounted on 115 in. wheelbase.

The chassis layout for this new car is very clean. The hand brake is on the front end of the propeller shaft. There is only one universal in the drive, which is a Hotchkiss type with long semi-illiptic springs. The engine is unit powerplant mounted directly in the main frame, the arms on the bell housing acting as a substantial cross member. There is a cross member a little behind the center of length of the chassis, this being a flat inverted U-section heavily gussetted to the main frame. Behind the rear axle there are two rear cross members between which the cylindrical gasoline tank is suspended.

New Hudson Coach

The new Hudson coach which is to sell at $1,795—$50 more than the seven-passenger phaeton and $100 more than the five-passenger—is on exhibition for the first time. It incorporates a number of economy features in closed body construction. Economy has been effected by the elimination of the curved pieces of wood. Substantially all pieces of wood in the body framing are cut on straight lines. This not only materially reduces the cost in preparing the wood framing for assembly, but also in a number of instances has resulted in making the assembly work much easier and far more readily handled on an interchangeable basis. An additional saving has been made in the use of two in place of four doors. This has been made possible by the adoption of individual Pullman type seats in front in place of the usual fixed type. These seats fold out of the way to allow access to the rear seat. The car is a five-passenger design. The rear seat is continuous across the body.

The type of body construction employed is such that it is possible to put it together in a number of sub-assemblies. The body may truly be said to be assembled instead of built up in the usual manner. There is no great amount of tacking to be done from the inside of the body. This can practically all be done before the body is put together. The roof furnishes a good example of this type of construction. The entire roof is practically a sub-assembly. It is a soft type covered with artificial leather. The actual ceiling or roof lining is put on before the roof is put on the body. The roof is then put over the top of this lining as an independent assembly.

Nash Carriole

The Nash Carriole, a five-passenger enclosed car, is entirely new in the Nash line this year and is mounted on the four-cylinder chassis. It is designed as a light enclosed family car. The price is $1,350, f.o.b. factory. The body of the car is an all-metal construction similar to that used on the higher priced sedans and coupes. The front seats are divided and both may be folded forward inasmuch as they are of the parlor car type. The driver's seat folds against the steering wheel and the right hand seat under the cowl when not in use. The front seats are upholstered in genuine leather and the rear seat in wool cloth as well as the interior trimming. There are two doors, one on each side, the left hand door being at the driver's seat and the right hand door directly opposite. Both doors are wide enough to make entrance and exit an easy matter. The front and rear windows may be raised or lowered by the turning of a handle. In the back of the car is a large plate glass window. There is a dome light for interior illumination. List price includes cord tires. It is pointed out by the makers that the low price for this car has been made possible because of the adaptability of its body design to volume production.

Moon Light Six

Moon has added to its line a new six-cylinder car, known as the model Six-40. This is a 115-in. wheelbase car to sell at $1,295. It is built up of such units as Continental engine, Timken axles, Spicer universal joints, Borg & Beck clutch, Delco starting, lighting and ignition, Exide battery, etc. The engine used in this car is the new model Continental 6-Y, having a bore of 3⅛ in. and a stroke of 3¼ in. One of the features of this engine is the use of the Sheppard valve. In this valve the conventional type of L-head layout is used with the exception that the valve spring is placed above the valve and engages with a rod or stem resting on top of the valve head. The engine is said to show 46 hp. on the block test. Camshaft and generator drive are by chain and are so arranged to be easily adjusted. The crankshaft is four bearing.

A new design has been incorporated in the frame in which four cross members are used. A characteristic of Moon frame construction is the molded gusset plate on the rear of the frame to add stiffness and afford protection to the gasoline tank.

One of the features of the Timken axle used in this car is the mounting of the pinion shaft. The shaft bearings are mounted fore and aft of the pinion gear, which reduces the overhang on the pinion shaft and assures a positive method of lubrication to the axle proper. Other details include spiral gears, foot brake on rear axle, emergency brake on transmission. The springs are semi-elliptic, the front being 36 in. long and the rear 54 in. The propeller shaft is of large diameter to prevent whipping at high speeds.

Other features of the chassis include a Gemmer steering gear with an 18 in. wheel. The radiator is a cellular type with a shell made of German silver. The gear shift lever is provided with the Johnson Theft Lock. The fuel tank is placed in the rear and the bracket of the extra tire carrier is fastened to the gusset plate protecting the tank.

The body is built of silver finish steel. Deep one piece stamped fenders of good design are used. The one piece construction makes them rigid and free from rattle.

The tire size is 31 x 4 in. and the tires are cord. Wire and disk wheel equipment includes an extra wheel. The car shown at the Chicago Show was fitted with disk wheels. One of the things noted about this car is its low and rakish appearance. The radiator design is substantially the same as that on the larger Moon car.

A SLIGHT error appeared on page 12 in AUTOMOTIVE INDUSTRIES of January 5, concerning the products of the Midwest Engine Co. The statement was made that "perhaps the most interesting feature of these engines is the use of two-bearing counterbalanced crankshafts. . . ." The following correction of this statement is made by the Midwest company:

"Our largest sizes, that is 4½ x 6-in. and 4⅛ x 5¼-in., are three-bearing jobs. The model 408, which is 3⅝ x 5-in., and model 409, which is 3¼ x 4½-in., are two-bearing jobs. The latter differs from the model 408 only in that the 409 is thermo-syphon cooled, while up to the present time the 408 has had pump circulation."

Exports of Automobiles, Tires and Motorcycles for December, 1921

COUNTRIES	COMMERCIAL				PASSENGER					TIRES			MOTOR CYCLES	
	Complete Cars		Chassis		Complete Cars		Chassis		Parts	Casings	Inner Tubes	Solid Tires		
Europe														
Azores and Madeira Islands	2	$874	1	$495					$2,987	$66			7	$1,945
Belgium			15	6,557	43	$25,100	21	$7,690	6,073	1,987	$768		34	9,639
Bulgaria					1	508			533					
Denmark					4	3,580	11	1,945	9,625	32,243	1,047			
Finland									1,716	907	92			
France					4	7,100			96,291	7,990	8	$700		
Germany									9,660	1,560	7			
Gibraltar									1,685					
Greece					1	725			3,924	22,954	2,708	372		
Hungary									34					
Italy					1	1,000			5,185	11,920			35	9,696
Latvia													8	2,867
Malta, Gozo, and Cyprus Islands					4	3,070			686	1,450				
Netherlands	22	9,615	12	5,245	22	15,440	2	5,600	9,275	6,358	1,214		44	13,471
Norway			2	1,896	3	2,600			16,489	14,372	4,216	113	11	1,666
Poland and Danzig	2	6,939	2	6,939	1	728			1,180	1,885	497			
Portugal									2,322	4,340				
Roumania									950					
Russia in Europe	10	9,700			5	5,700			286					
Spain					25	28,883	2	4,386	20,135	36,240	3,872	1,708	4	1,410
Sweden			5	13,471	19	20,531	2	1,456	20,740	39,292	2,836	1,071	15	2,705
Switzerland					1	1,500			1,871	2,194				
Turkey in Europe									47					
England			4	4,213	116	57,902	143	57,749	907,266	163,438	11,781	5,423	95	27,258
Scotland									201	700	190		1	345
Ireland									2,323				1	325
Jugoslavia, Albania									1,946	12,986				
North and South America														
Bermuda										50				
British Honduras					3	3,633			44	175	50			
Canada	15	15,333	19	28,545	162	199,212	4	8,800	797,465	108,628	11,503	5,866	11	2,717
Costa Rica					3	5,527			1,658	1,405	67	200		
Guatemala					4	3,824			967	3,466	314		1	300
Honduras					5	3,896			4,202	565	63	564	3	900
Nicaragua					1	750			158					
Panama	12	34,228	19	6,946	18	14,168			1,777	389	97	69	2	850
Salvador									3,033	4,358	853	1,504		
Mexico	31	29,424	34	11,272	426	375,022			86,298	61,805	7,485	3,427	5	1,116
Newfoundland and Labrador									275					
Barbados					3	3,087			1,054	3,397	520	450		
Jamaica	2	1,285			24	17,466	4	7,800	9,611	8,280	1,033	2,417	1	45
Trinidad and Tobago					5	4,046			3,128	5,831	741	1,228	1	300
Other British West Indies			3	1,311	14	9,020			1,808	1,141	234	20		
Cuba	22	16,445	1	1,862	86	113,503			26,665	47,609	3,025	15,782		
Virgin Islands of United States	1	365			2	1,028			2,759	408	40	3,210		
Dutch West Indies					5	2,202			1,141	2,047	58			
French West Indies					1	640			1,366	2,026	271	112		
Haiti					2	1,140			2,403	3,379	472			
Dominican Republic					8	4,713			3,333	6,925	1,475	227		
Argentina					56	68,760			158,967	119,815	10,609	1,630	40	12,410
Bolivia					1	4,000			248	250	25			
Brazil	1	2,000	1	1,607	22	24,487			35,644	10,178		757		
Chile			2	874					4,727	27,074	2,907	2,442		
Colombia	1	933	3	6,462	23	19,664			13,726	6,002	878	315	1	100
Ecuador	2	974	2	404	2	767			240	2,097	317			
British Guiana									973	1,435	171	110		
Dutch Guiana					4	2,573			1,166					
Paraguay									1,835					
Peru					7	5,165			8,848	14,316	1,413	1,275		
Uruguay			10	2,742	8	7,965			11,772	16,542	500		15	5,103
Venezuela	5	2,185			35	28,405			6,015	18,126	909	256	1	320
Asia														
Aden									281					
China	3	8,250	8	4,000	28	36,206			5,821	2,523			1	100
Kwantung, leased territory	1	3,000	1	1,887	1	3,200			165					
Chosen									594				1	350
British India	4	4,569	12	14,764	112	113,106	5	5,328	34,250	8,512	965	8,266	4	927
Straits Settlements									6,212	10,330	108	4,587		
Other British East Indies			2	930	4	55,655			1,043				11	2,970
Dutch East Indies			1	1,458	64	94,533			46,774	43,106	7,089	8,154	40	9,609
French Indo China									238					
Greece in Asia			2	734	6	2,112			21					
Hongkong					3	2,800			415	1,094	556	1,503		
Hajas, Arabia, etc.		5,880							1,236	5,626				
Japan	6	11,000	58	35,790	6	4,395	104	42,477	34,597	12,406	1,049	3,485	76	19,923
Palestine and Syria					57	33,426			12,258	7,741	998		1	250
Persia										391				
Siam									824	530		213		
Australia	5	6,325	102	137,012	109	116,796	572	500,723	100,542	33,303	1,151		278	83,351
New Zealand			4	6,602	51	45,556	2	2,064	27,149	57,451	2,089	15,471	100	33,236
Other British Oceania									1,179			516		
French Oceania					1	800			598	1,091	52	312		
Other Oceania									760	687	66	112		
Philippine Islands			1	2,600	15	155,613			34,214	38,841	5,598	6,045		
Africa														
Belgian Kongo			10	4,371					248					
British West Africa					5	4,219			6,976	24,693	1,632			
British South Africa			7	8,147	100	101,332			24,537	88,465	746		14	3,945
British East Africa					1	343			1,824	7,796	568		1	308
Canary Islands					3	5,985			12,919	4,465	109			
French Africa					4	2,885			3,784					
Morocco											72			
Portuguese Africa			3	1,311	10	4,941			56		208			
Spanish Africa					2	6,950			335					
Egypt	10	4,371	4	1,748	22	9,381			7,098	3,508	231			
Total	161	$173,695	350	$322,195	1,784	$1,759,264	872	$646,018	$2,683,681	$1,193,160	$98,553	$99,912	863	$250,457

Functions of the Dealer in Car Distribution

This article outlines clearly the place of the dealer in the system of car distribution. Mr. Tipper shows the necessity for reducing factory supervision to a minimum, that strong dealers may be developed through individual responsibility. Car reputation bound to its local condition.

By Harry Tipper

THE whole distribution system in the marketing of passenger cars hinges upon the retailer. The position of the retailer, his business acumen, his strength, his ability to conduct properly the various departments required in the automotive business and the service he renders, are things upon which the market of the individual manufacturer depends. They are also the limiting point of the total market for automobiles to a very large degree.

The retail distribution of cars has grown with great rapidity and the retailers have come into this business from all kinds of occupations and in all kinds of ways. Most of them have not been in the business five years. They are still adventurers in what is a new line of endeavor for them. They have been able to erect a large volume of business upon a small capital during the era of rising prices and easy markets. Some of them have developed into strong, capable business men handling the largest concerns in their communities. All of them are important in the business life of their various communities and the influence which they exercise in various ways upon the community reacts upon the automotive business from that community.

At the risk of being wearisome, it is necessary to repeat the statements about the short life of the average dealer in the passenger car field today and the diversity of other occupations from the ranks of which these automotive dealers have been drawn. Without this picture, the manufacturer has no groundwork upon which to draw the possibilities of future development. In one small town seven car dealers represented these original occupations: one had been a successful plumber; one had been in the real estate business; two had been automobile mechanics; one had been a salesman for cars; one had been set up in the automobile business by his father because he had always been tinkering with cars; and one had been a chauffeur.

This picture can be repeated, not in the actual occupations, but in the diversity in almost any fair sized town in the United States. Implement dealers, old bicycle repair shops, salesmen, automobile owners of various kinds, and a host of others who have entered the business of retailing in this field have expanded, in many cases, with great rapidity, so that they have been obliged to meet unknown problems day after day and with but very slight experience.

Under these conditions, there must exist a wide difference in efficiency, a very great difference in the knowledge possessed and the initiative exercised by these various retailers. These, however, are established concerns. As they drop out, new concerns come in from other lines to take their places, although each year a larger number of those entering the business do so with a previous experience in the same field. The automotive manufacturer must work with these established retailers and his business depends upon their efficiency very largely.

We have stated before that the sale of passenger cars possessed many differences from the sale of other products. The passenger car is useful entirely for the service which it renders in its daily transportation of people. The efficiency of that service depends very greatly upon the character, the judgment, and the skill of the local retailer. The reputation of the car is involved in that service, in that locality, at all times. At no time can the reputation of the car be divorced from this local condition. Every man who knows the business has scores of illustrations indicating the strength of this reaction upon the reputation of the car from the character of the local service rendered in connection with its use.

Regardless of the position held by the individual manufacturer concerning the advantage of distributors for his particular purposes, the only possible method of securing a market for passenger cars requires an efficient and stable line of retail establishments located at convenient points all over the country, so that the user of the vehicles can do his buying and secure his service in his ordinary zone of activity.

The functions of the retailer are:

First.—To sell cars within his local area; to obligate himself for a definite number of cars in advance of his sales; and to undertake their distribution in the local zone of his activity.

Second.—To keep in stock such items as may be required for the ordinary service of the user of the car and to provide sufficient storage space for cars while they are being served in this manner.

Third.—To establish the equipment sufficiently to conduct the ordinary necessities of service and repair expected by the user, and to establish these on a reasonably rapid and fair basis.

Fourth.—To maintain the departments of his business so that all the commodities required with the car and for the car can be readily secured by the customer within the reasonable necessities of the locality.

In the course of this rapid growth in the automotive field, the functions involved in retailing and servicing automobiles have not yet arranged themselves in what would be a logical or orderly percentage of development. Because of the lack of efficiency in service in many localities, exclusive repair shops have grown up. There are many exclusive storage places in the larger cities, and

there are still car sales establishments unable to give the proper service to the user of the car. Supplies have not been thoroughly considered, and, in general, the present situation presents many weaknesses and much confusion. This, however, is only the natural result of the growth and the entry of a large number of people into the business of retailing from so wide a diversity of previous occupational background.

In comparison with other lines of retailing covering the small cities and towns of this country, the retailing of passenger cars, the necessary service and repairs, the proper stocking of supplies, etc., represents a large business and a business involving problems foreign to other lines of retailing; more severe and requiring a more effective experience to efficiently work them out. In other words, the efficient distribution of passenger cars requires a higher type of retailing merchant than the ordinary work of retailing goods over this country. To arrive at a decent efficiency, therefore, a longer experience is necessary and much more work must be done in the development of this branch of the field.

In the retailing, as in the wholesaling of a product, the efficiency of the business depends very greatly upon the judgment, initiative, and capacity of the individual concern. Methods of stocking, advertising aids, sales manuals, etc., are of little value unless they are backed by the use of considerable judgment and initiative on the part of the individual retailer. There is, in fact, a degree of danger in the control of the retailing system by the manufacturer too closely in detail, because this produces a tendency on the part of the retailer to lean more and more on the centralized system of the manufacturer until his individual efficiency has finally decreased very materially.

THE dealer or retailer is an essential part of the automobile marketing scheme, regardless of the decision between distributers and factory branches. He has four distinct functions, which are outlined here in detail.

The best dealer organization is the one in which the individual dealer assumes a maximum of personal responsibility. Educational activities by the factory are of little value unless backed up by the judgment and initiative of the individual dealer.

The wide variation in the standards, in the equipment, and in the efficiency of retail establishments selling passenger cars is a difficulty of very great proportions and a difficulty which cannot be overcome merely by a closer supervision of the retailer from the factory. There should be a very much closer co-operation between the retailer and the factory, more open discussion, and more effective understanding of the problems common to both. The supervision itself should be kept at a minimum at all times because the industry needs stronger dealers, larger numbers of stronger dealers, widely distributed throughout the United States, in order that the future problems may be worked out. Strong men are not created by close supervision. They are developed by larger understanding and the necessity for proper decision upon the larger points at issue. The distribution work, particularly in retailing of passenger cars, is not yet a system. There has been no time to create a system in the few years of widespread distribution of passenger cars. The elements of the future system are here—the development into a system depends very greatly upon what the manufacturer does with it during the next five years. If the retailing of passenger cars is standardized with too much uniformity and too close a supervision from the factory, the sale of passenger cars will be limited by the character of the system itself. If the manufacturers arrange matters with the dealers so that the main problems are understood, and the main interests of passenger car sale and service are covered, and if these matters are followed up with a better type of co-operation and discussion, the distribution, as far as retailing is concerned, can be gathered together in the next few years and welded into an actual system out of the diversified elements at present in the field.

In general, the retailing of passenger cars requires an improvement in the selling methods, an understanding of turnover in its relation to capital and profit, better acquaintance with financing, more careful cost consideration, in the extension of service and conduct of repairs, a more definite understanding of the local needs in connection with supplies and accessories, a greater understanding of the manufacturer's policy and position, and a development with the manufacturer of thoroughly understood contractural arrangements with reference to the handling of used cars, the cost and character of service, etc.

This is a work which depends upon the growth of a better understanding between the manufacturing and the retailing branches of the industry and, particularly, between the individual manufacturer and his retail dealers. It calls for a method of square dealing not only, but in addition intensive attempts to develop strong dealers by putting the facilities of the manufacturer's wider experience and information at the service of the dealers for their improvement and development. It is said that there are only eight thousand dealers in the field today, rated at $10,000 or over. Only a comparatively small number of dealers, so-called, are strong business houses. The manufacturer requires, however, a much larger number of dealers than eight thousand for the distribution of cars in this country. The number of worth-while dealers in passenger cars is, however, probably not more than 40% of the total in the field.

It is the business of the manufacturer to see that his own sales possibilities are limited very strictly in accordance with the efficiency, the ability, and, to some extent, the number of his outlets. It is his important interest to see that the dealers are given the opportunity and encouraged to reach higher standards of efficiency so that the business may be stabilized all through, the markets thoroughly canvassed, the local influence of a character that will breed confidence, and the whole atmosphere surrounding the distribution of cars one of development.

In the face of the present confusion, the problems of the manufacturer in connection with his distribution may lead to errors of development just as easily from a desire of speedy solution as they may lead to a lack of development from the tendency to avoid facing the entire issue.

One of the steps the manufacturers could take would be to encourage strong associations of dealers all over the country with their national affiliations through the present National Automobile Dealers Association or some similar body, and with well defined programs of education through their own memberships for the stabilizing of the business. Followed up by the work of the individual manufacturer with his individual dealers, these developments would have a very great effect upon present problems and be of great service in clearing up the present confusion and in clarifying the situation generally.

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE
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Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
David Beecroft, Directing Editor
U. P. C. Building, 239 West 39th Street, New York City

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Trucks Can Be Sold

FARMERS at the agricultural conference in Washington were almost unanimous in asserting that the farm market for motor trucks will be open again in the late summer or early fall. The consensus of opinion developed by a number of interviews during the conference revealed almost startling facts. It proved conclusively that the majority of farmers are thoroughly sold on the motor truck as an economic necessity, and that they are eager to buy more trucks as soon as they are financially able to do so.

This paints a brighter picture than has been seen for many months. It is true that farmers in certain grain sections are down and out, but it is equally true that in some sections the farmer is in the market for trucks right now to a limited extent.

It will be necessary to go out and market trucks during the next few years, just as it will be necessary to market other automotive products that have sold themselves up to a year or so ago. There is a market for trucks, and that market will develop the most rapidly for the manufacturer who most thoroughly analyzes his sales possibilities, his merchandising costs and his marketing methods.

Making Standards Effective

THE automotive industry has for a long time been in the van of the standardization movement. Yet many of the standards adopted by the engineers of the industry are still a matter of theory rather than practice. Executives, in certain instances, seem to be unable to visualize the fundamental nature of standards as related to their more general industrial problems.

The Chamber of Commerce of the United States has just issued a statement through its Fabricated Production Department, which emphasizes again the practical financial value of standards, and should strengthen the resolution of the automotive industry to put into immediate widespread use at least all of those standards already adopted by its engineers. The Chamber of Commerce report states in part:

"It takes backbone to tell your sales forces in these times that you will cut your variety. But it is being done not only by individual producers but in entire lines through trade association co-operation. . . . The important rôle which standardization plays in industrial evolution is not generally appreciated. . . . It enables buyer and seller to speak the same language and makes it possible to compel competitive sellers to do likewise. It stabilizes employment by broadening the possible market and by making it safe for the manufacturer to accumulate stock during periods of slack orders to an extent that would not be safe with an unstandardized product."

Many other benefits of standardization are enumerated in this report. Like those noted here, they are not new. They have been stated and restated many times. Yet the difficulty of putting into operation certain standards, the advantages of which would seem almost obvious, indicates that the same thing must still be said many times more. Standardization means financial gain to all those buying and selling within the automotive industry and it means more satisfactory service for the users of automotive products.

Research

A GREAT deal of so-called research work is not research at all, since it does not consist in a seeking for fundamental reasons, but merely in the collection of data. It is not hard to obtain men capable of collecting data, but to get men thoroughly capable of comprehensive and analytical research is a difficult problem.

The development of competent personnel for all kinds of research is one of the pressing problems of the automotive industry. There are already a few great names connected with technical research in our industry. The development of more men capable of and interested in going forward with the work done by these few will have much to do with the progress of the industry during the next decade.

The field of market research is particularly in need of careful study. Production economies have borne the weight of increasing marketing costs for ten years. The limit in this direction has just about been reached. A thorough study of every phase of automotive marketing is essential. And just as in engineering research, there is a necessity for more men capable of thorough, fundamental research.

Servicing Trucks

THE progress of the truck industry rests not only upon the mechanical efficiency of the motor truck, but also upon the ability of users to provide proper operators and to obtain proper service facilities in a majority of cases. A co-ordination of all of these factors is necessary to the economical use of motor transport, and the truck manufacturer is interested, consequently, in the entire field.

Adequate service is essential. And adequate service implies a sufficient supply of capable mechanics. The truck industry might perform a real service for itself and its customers by defining some standard by which the capability of a mechanic might be determined. It was suggested at the recent S. A. E. meeting, for instance, that the S. A. E. set standards as regards the qualities and training necessary for a man who is to properly service the trucks designed by the engineers of the society. The thought behind the suggestion probably was that such standards would ultimately aid in the development of more capable and trained men for truck service work.

Whether or not the suggestion itself is practicable, the idea which it contains is worth consideration. The engineer is undoubtedly hampered in his design by the knowledge that his product will probably be subjected to incompetent operation and service.

Better Brakes

THE inadequacy of the brakes fitted on many American passenger cars has been the subject of much comment which reflects little credit upon those responsible for existing conditions. The problem is of such a serious nature, however, that it should not longer be overlooked. In the case of cars used in hilly country it is difficult to make the brakes, especially of a heavy car, adequate to meet the extreme conditions of service sometimes encountered. Under such conditions experienced drivers invariably use the engine for braking, but there is always danger for, as well as from, inexperienced drivers, so that efforts to provide adequate brakes are most important. It is highly desirable also to make it as convenient as possible to use the engine as a brake, for it is next to impossible to provide adequate brakes for long and difficult grades when these alone are depended upon for the necessary retarding effect.

Braking troubles frequently arise as a result of heat generated by the friction of the brakes. This sometimes results in materially lowering the coefficient of friction of the lining, which decreases brake capacity accordingly. This difficulty is apt to be accentuated when both sets of brakes bear upon a single drum or pair of drums from which the heat is not rapidly radiated. For this reason there is a decided advantage in having independent drums for each set of brakes. There is much to be said in favor of so-called transmission brakes, or brakes located at the axle end of the propeller shaft. On the other hand, such brakes are not always easy to keep cool.

Another fault with many hand brakes is the failure to provide a secure locking ratchet. Some drivers even have to make it a practice to leave the car in gear when it is standing on an incline, for fear the hand brake will release itself and the car start to roll.

These are but a few of the items in connection with braking systems which deserve attention. Cars with defective brakes will still run, even though they may fail in an emergency, and this perhaps is one reason why refinement in braking systems has not kept pace with refinements in other parts of the car. But if skimping must be done it should never be at the expense of safety, hence the subject of improvements in braking systems should be given the thought it deserves and no time should be lost in incorporating those improvements which the safety of the users and others demands.

Now the Tractor

FORD has gone and done it again, this time in connection with the tractor phase of the automotive industry. A tractor at $395 is something new to the tractor industry—and to the farmer. Whether or not there is any connection between this radical price cut and the strong opinions expressed by the farmers at the recent agricultural conference may be open to question. It is certain, at least, that such actions in the tractor industry are in line with demands of tractor buyers.

The farmer is "all hepped up"—to use a current phrase—concerning the relatively low price which he gets for his production and the relatively high price he has to pay for the production of other industries. He does not appear to be interested so much in the reasons for this condition as in the mere fact that he is placed in an unfavorable position. The psychology of the Ford action can scarcely be questioned.

The Statistical Number

THE Statistical Number of AUTOMOTIVE INDUSTRIES will appear this year on Feb. 16. It will contain the same fundamental statistical data concerning every phase of the automotive industry that has characterized past editions. Certain new features have been added, chief of which is the table and analysis of world automobile registrations which has just been completed as a result of a world-wide survey. More detailed information concerning domestic production and sales will be printed, and much of the information will be visualized in chart form.

There has always been a large demand for extra copies of this Statistical Number. In past years the supply has always run short. If you desire any extra copies of this number, order them immediately.

Good Spring Trade Now Appears Sure

Sales Deferred But Chicago Show Exerting Strong Stabilizing Influence

By James Dalton

NEW YORK, Feb. 1.—While uncertainty in regard to prices slowed up materially motor car sales in January, there is evidence throughout the country of a satisfactory deferred spring business. The Chicago show which is now in progress is likely to exert a strong stabilizing influence. Price changes in connection with the display have been less numerous than had been expected, and it is apparent both manufacturers and dealers believe they have been placing too much emphasis on prices and not enough on the value of their product.

Quality Is Stressed

While more stress was laid on prices than on quality at the New York show, the reverse has been true in Chicago. The same deep interest in motor cars displayed at New York is being shown at the present exposition, and it is probable more actual sales will be made.

Managers of shows already held in the smaller cities are unanimous in the statement that the attendances were larger than in 1921. Visitors evidenced more interest in automobiles, but price uncertainty has been an important factor in retarding sales and prospects have held off on that account. There are indications everywhere, however, of a good deferred business in the spring.

Public Is "Motor Wise"

Another reason for delay by prospective purchasers is a desire to familiarize themselves with the merits of the many new models which have been brought out this year. The public is becoming "motor wise" and, while it is interested in price, it is equally interested in quality.

The waiting attitude of prospective purchasers has been reflected in the factories, but January production exceeded that of December by a considerable margin. This was due, in part, to the fact that the final week of December was employed almost universally in the industry for inventory taking, but schedules were increased as soon as manufacturers realized that attendance at the New York show was larger than ever before. This finally convinced them that sales for the first quarter this year would exceed the business done in the same period of 1921.

As a consequence, parts and accessory manufacturers are doing a somewhat better business than they did in December, and many of them have booked substantial orders for February and March. Collections are not quite so good as they were in November, although about on a par with December.

Motor Truck Trade Revived

One of the encouraging factors in the automotive situation at this time is the unmistakable evidence that the motor truck end of the industry is coming to life. Most truck companies are reaching the bottom of their inventories and some of them are giving releases on commitments which have been held up for a year and a half. Companies manufacturing light delivery cars apparently are making more progress than those which confine their operations to heavier vehicles.

Most of the parts makers are getting considerable new business as compared with the past few months, when their operations depended largely on releases on commitments made previously. This is due to the fact that inventories are down and sales are for current production. Sales for January were much better than for January last year.

Overland to Produce New Commercial Car Chassis

DETROIT, Jan. 28—Orders for 500 Overland and Willys-Knight cars were placed by dealers with Simons Sales Co., Michigan distributor, at a meeting and dinner given by Guy O. Simons during show week. Simons said his company would market 7000 Willys cars in Michigan during the year.

The meeting was addressed by Charles B. Wilson, vice president and general manager of the Willys-Overland Co., Toledo, and A. C. Barber, sales manager. Wilson told of economies in manufacture being instituted through the consolidation of operations. Barber said Willys-Overland would produce within sixty days a new commercial car chassis which will be marketed through all Willys dealers.

NATIONAL MOTORS REFINANCED

INDIANAPOLIS, Jan. 29—The National Motor Vehicle Co. of Indianapolis has been refinanced to the extent of $750,000. Bonds will be issued on the mortgage of the plant which was placed by the Fletcher Savings & Trust Co. of this city. The mortgage covers only the plant and equipment and does not affect what stocks of parts and materials there may be on hand at any time, nor the cash resources of the company.

Output Increases As Shows Progress

Response of Public Is Active, Factory Representatives Report at Chicago

CHICAGO, Jan. 30—Production is stepping up at the factories as the show season progresses. Reports of factory representatives at the Chicago show evidence buying responses at the January shows exceeding the expectations of dealers and manufacturers alike and holding out promise of a steady improvement in the automotive situation.

Many of the factory men report their dealers as having devoted a large part of the past few months toward clearing out the bulk of their used car stocks in preparation for active sales campaigns. Now with their used cars down to a working level the dealers are putting additional impetus behind their show efforts and this is bringing the actual sales high.

Responses to the appeal of new models offered by some of the smaller producing companies indicate that the public has not yet bound itself to confine its buying to certain large producing lines. One of these is said to be sold several months ahead as a result of orders placed at the January shows, and several others report themselves as rushed to meet delivery demands.

Addition of units are reported planned by at least one company, which is now at capacity and finds itself nearing the point where it will have to increase its facilities.

Toledo Plants Feel Effects

TOLEDO, Jan. 30—The influence of the automobile shows is already beginning to be felt in the industry as far as Toledo plants are concerned.

The local branch of the Chevrolet Motor Co. is gradually expanding its working force and expects to reach its normal of 2500 men within the next two months.

(*Continued on page* 252)

Brings Service Truck Contract from Poland

WABASH, IND., Jan. 28—R. E. Taylor, representing the Service Motor Truck Co. of Wabash has just returned from Poland with a large contract with that government for trucks, tires, machinery, etc., to be supplied to the Polish War Department.

Other Indiana companies that may receive part of the business of the truck order are the Midwest Engine Co., the Oakes Co. of Indianapolis, the Pressed Steel Products Co., Michigan City; the Ross Gear & Tool Co., Lafayette; the Bimel Auto Wheel & Spoke Co., Portland; Muncie Malleable Iron Co., Muncie; the Muncie Foundry Co., Muncie, and the Fairmount Drop Forge Co., Fairmount.

Dyneto Creditors Aid Reorganization

Announcement of Definite Plan Expected—Majority Stockholder Makes Two Proposals

SYRACUSE, N. Y., Jan. 30—Complete reorganization of the Dyneto Electric Corp. of this city, manufacturer of self-starters, lighting systems and small motor generators, will soon be announced by R. M. Owen, majority stockholder of the concern, which recently went into the hands of a creditors' committee with apparent liabilities of $700,000.

Many of the claims against the company have been rejected by the special master. The readjustment of the company's affairs has been in progress for nearly a year. When the financial difficulties of the company first became known, Carl L. Amos of this city, head of the concern, offered to settle with creditors on a basis of 50 cents on the dollar on deferred payments. The creditors were willing to accept this plan, but it fell through before realization.

Then Owen, who controls the Owen Magnetic patents, offered the creditors 33 1/3 cents on the dollar in cash or the option of helping furnish the cash necessary to meet the cash offer on a pro rata basis, and reinstatement in the reorganized company with full claim credit to be paid on a long term obligation basis without interest. The payments were to extend over a period of five years.

About 95 per cent of the creditors have accepted either one of the two plans, and Owen and the creditors' committee have been making efforts to obtain unanimous consent of the remaining five per cent. It is hoped to meet the cash payments within the next week or ten days.

The definite plans for the new corporation have not been made, nor is the directorate known. The new company will probably carry the name "Dyneto" in some way.

All former heads of the corporation have severed their connection with it, and a complete reorganization is in sight.

When the plant was operating at full capacity it employed between 300 and 400 persons, but for the last year only an office force and a few machine operators have been kept at work.

Rolls-Royce Production Nearly Four Cars Weekly

SPRINGFIELD, MASS., Jan. 28—Rolls-Royce of America, Inc., has added 200 men to its factory force and has brought its production close to four cars a week. Owing to high-class workmanship involving a great deal of hand work, the amount of time given to testing and the large size of car produced, a rapid output of cars is not attempted or desired.

Special attention is now being paid to the development of new body designs. A wage readjustment has been effected at the plant, by which the basic pay rate has been reduced from 57 to 42 cents an hour. The premium plan is continued in force, enabling an employee to receive extra pay when completing work in less than the time alloted for a given task. The regular 48-hour weekly schedule is being maintained.

Franklin Cuts Parts Lists to Within 7 Per Cent of 1914

SYRACUSE, N. Y., Jan. 30—A reduction in prices of parts ranging from 10 per cent to 40 per cent, and effective Feb. 1, is announced by the Franklin Automobile Co. It is pointed out that the greatest reduction is made on those parts which are more generally in use for overhaul or maintenance purposes, as reground crankshafts, rebored cylinders, new pistons, etc.

Improved methods of manufacturing, which were made possible by the establishment of a new plant under separate control, has made much of this reduction possible, according to F. J. Leyerle, service manager. This, he states, combined with economies effective in purchases, labor and operation costs, has made it possible to bring the present prices on parts to within 7 per cent of 1914 prices.

"In revising the prices at this time," Leyerle says, "we are giving the owner the benefit of present cost, regardless of inventories on hand purchased and produced at higher cost."

File Bankruptcy Petition Against Revere Motors

INDIANAPOLIS, Jan. 27—An involuntary petition in bankruptcy has been filed against the Revere Motor Car Corp. in the United States District Court here by three Cleveland concerns. The petition was preferred by the Cleveland Hardware Co. with a claim for $154; the Cleveland Tack Co., $464, and the Cleveland-Akron Bag Co., $213.

John P. Porter, one of the stockholders of the company, who said he represents more than 9000 creditors, came to Indianapolis from Buffalo to aid in filing the petition. Porter claims that the concern was incorporated for $3,000,000 and has liabilities of $5,000,000. The corporation disclaims possession of more than $100,000 in assets, but Porter contends that the assets are really about $2,000,000.

GRINDING COMPANY FORMED

FLINT, MICH., Jan. 30—The Arnold Grinding Attachment Co. has been organized here to manufacture an automatic micrometer gage used on grinding machines, local capital being provided by J. M. Barringer, R. T. Perry and Carl W. Bonbright. The gage is the invention of P. S. Arnold of Detroit.

Price of Fordson Is Reduced $230

Ford Tells Dealers Purpose Is to Help Increase Prosperity of Farmer

DETROIT, Jan. 28—A reduction of $230 in the price of the Fordson tractor was announced personally by Henry Ford by wireless telephone to the Ford dealers assembled at the Fordson Tractor Industrial Show in Cleveland last night. The new price is $395. In his talk Ford said the price revision was to help bring increased prosperity to farmers by permitting use of improved methods.

"It is certainly wonderful to sit here in my office and say a few words of greeting to you Ford dealers of the Cleveland territory," he said. "The radio is on outstanding tribute to man's inventive genius. They say there is nothing new under the sun, but we are constantly inventing new things, every day bringing some big improvement over the previous day's methods."

Continuing, he said:

Manufacturing operations have undergone some wonderful revolutionary changes during the past few years. We are all familiar with the big improvements in transportation methods, but the oldest industry has been the most backward in the acceptance or adoption of the new and up-to-date methods of doing things, and that is the farming industry. Being a farmer, I am vitally interested in all farm inprovements, and with this in mind, I have spent years of time and millions in money in the development of the Fordson.

Must Lower Cost of Production

As a general thing, the farmers have bettered their financial condition during the past 18 months, but the production costs of farm products are still too close to selling prices to allow fair margins of profit. What the farmer must do to put his business on a paying basis is to lower the cost of planting, cultivating and harvesting of his crops. This alone will increase his profits, and with this thought in mind it has been our constant aim to lower the price of the Fordson so that every farmer in the land could afford to own one.

It is a pleasure, therefore, to announce through your Ford dealers that we have to-day decided that the tractor price should again be reduced, and in considering a reduction, naturally my thought has been to make it possible for the largest number of farmers to share in the benefits to be derived through the use of our tractor, and consequently, effective Jan. 27, 1922, the new prices of the Fordson tractor will be $395 f.o.b. Detroit.

This is a cut of $230 off the present price and while in making this big reduction we have taken upon ourselves a gigantic task in the reduction of manufacturing costs, still that task, in my opinion, is not larger than the farmer's problem of to-day, and I am glad to do my part in bringing about a period of increased prosperity for the farmer. Your part is to carry this message to the farmer, thereby enabling him to produce more with less cost and shorter hours.

I am glad to have had this opportunity of talking with you and you have my best wishes.

Court Limits Date for Willys Claims

Must Be Filed Before April 1—Audit of Books Is Ordered

TOLEDO, Jan. 30.—An order fixing the limit date for filing claims against the Willys Corporation was signed by Judge Killits in Federal Court here Saturday. Claims may be filed in any of the district courts where receivers have been appointed on or before April 1, 1922. All will then be reported to the Toledo court.

Colonel Hartwell, representing New Jersey creditors, asked the court for $175,000 of the funds held by New York receivers for meeting city taxes and payroll at the Elizabeth plant. He said the $13,000,000 plant there is 95 per cent completed and that there are liens of $1,700,000 against it. New York attorneys declared there was a heavy demand for portions of their $700,000 now on hand. A Federal tax claim of $200,000 may be presented any day. Judge Killits said he would sign the order requested by Colonel Hartwell provided it was satisfactory to other creditors.

Orders Audit of Books

TOLEDO, Jan. 28—As a step toward untangling the difficulties of the Willys Corp., Judge John M. Killits, in Federal Court here, has ordered the receivers, Frank P. Kennison, Clement O. Miniger and Francis G. Coffey, to proceed with a general audit of the corporation's books. The receivers were also empowered to name the auditors.

The court also authorized the purchase by the receivers of 4315 electric batteries, valued at $495,000, from the Electric Storage Battery Co., Philadelphia. The contract for the batteries was entered into before the receivers were appointed.

The receivers were authorized to accept in settlement of a claim of the Willys Corp. against Earl Motors, Inc., debentures and preferred stock in the amount of $28,035.

Another order was entered requiring the receivers to demand from the Cleveland Trust Co., Cleveland, the Fort Dearborn National Bank, and the Merchants' Loan & Trust Co., Chicago, and the First National Bank, St. Louis, statements of special accounts carried by the Willys corporation in those financial institutions.

Hearing on the intervening petition of the United States Light & Heating Corp. will be held soon before Judge Killits in this city.

ALLEN DEAL NOT CLOSED

COLUMBUS, Jan. 29—Frank P. Shaw of Chicago, who offered $570,000 for the plant and practically all assets of the Allen Motor Co. of Columbus, which has been in the hands of W. C. Willard and George A. Archer as receivers for some time, has not yet closed the deal. The offer was accepted by Judge Sater in the Federal Court.

According to local interests in touch with the situation, no plans for the future operation of the plant have been worked out. H. C. Runyon, who is in charge of the property, has been giving service to owners and selling what completed cars are on the floor.

Franklin Will Seek Hundreds of Dealers

SYRACUSE, N. Y., Jan. 30—"If every automobile dealer would get busy and go after the business it would be a great help toward restoring stability," asserted H. H. Franklin, president of the Franklin Automobile Co., at the annual meeting of stockholders. Franklin at that time announced that the company, to carry out this policy, will start an active campaign at once to obtain at least 250 additional sales representatives throughout the country.

It is understood that this is only the beginning and that the company has in mind a campaign which will enlist several thousand salesmen to handle the new four cylinder Franklin as soon as that car is put on the market in quantity.

At the annual meeting Ralph Murphy was elected to the directorate of the H. H. Franklin Mfg. Co. to succeed H. E. Maney, who became vice-president of the Franklin Automobile Co. and a director of that company. The manufacturing company directors elected are:

H. H. Franklin, Frank A. Barton, Giles H. Stilwell, A. T. Brown, E. H. Dann, Howard L. Franklin and Ralph Murphy. Mr. Franklin is president, John Wilkinson, vice-president, and Mr. Barton, secretary-treasurer.

Wilkinson, Maney, Barton, Franklin and Stilwell are directors of the automobile company with the same officers as for the manufacturing company.

Midcontinent Reorganized by Zenith Tire Receiver

TOLEDO, Jan. 30—E. G. Kirby, receiver for the Zenith Tire & Rubber Co., has returned from Wichita, Kan., where he aided in reorganizing the directorate of the Midcontinent Tire Co., which is practically the only asset of the Zenith company.

Kirby announces that J. A. Curtis, attorney, Cleveland; William Leary, president of the Zenith Tire & Rubber Co., Cleveland, and George W. Ritter, attorney, Toledo, in addition to himself, had been elected directors of the Midcontinent company to represent the 51 per cent stock ownership of the Zenith company.

He said the Midcontinent plant would produce about 800 tires a day for 1922.

ROAD WORK COST DROPS

COLUMBUS, Jan. 29—Cost of road building in Ohio has taken a tremendous drop, according to figures issued by the Ohio Highway Commission following the opening of bids on five highway projects.

Winton Co. Reduces Debts by $500,000

Mails Checks for Second 10 Per Cent Payment on Extension Indebtedness

CLEVELAND, Jan. 30—The Winton Co. has mailed checks for its second 10 per cent payment on its extension indebtedness. This, together with various other payments that have been made within the past sixty days, has reduced the company's debts by practically $500,000.

This is an indication of the thoroughness with which the company is adjusting itself to general market conditions. The newest model of the Winton Six, a 33-hp. car known as Model 40, has been announced to sell at $3,400—a decrease of $1,200 from the price of its previous model.

"This new low price," General Manager McEwen says, "reflects a bona fide result obtained within our own organization. In other words, by submitting every department of the business to critical analysis, we have freed ourselves from the notions and practices growing out of the war, which made manufacturing unduly expensive.

"We have decidedly lessened overhead by a readjustment of wage scales, by careful handling of purchases and the disposition of materials. We have at the same time adhered to rigid production standards both as to quantity and quality."

The Winton Engine Works, a Winton property which manufactures Diesel marine engines, has undergone the same readjustments as the motor car plant, and, in spite of a slow market, is producing 50 per cent of its capacity. New business booked during January is of such volume as to insure steady operation of the engine plant.

Charge Unequaled Rates Due to Insurance War

NEW YORK, Jan. 30—A cut of 20 per cent in automobile truck insurance rates in Boston in a rate war waged by stock casualty insurance companies against mutual companies, and an increase of 19 per cent in the rate in New York, which he intimated was used to recoup the losses in Boston, was revealed by Samuel Untermyer before the Lockwood committee.

The revelation was made during the testimony of Albert W. Whitney, associate general manager of the National Bureau of Casualty and Surety Underwriters, an unincorporated organization of 21 of the leading companies handling casualty insurance in New York state. Jesse S. Phillips, former State Superintendent of Insurance, became manager of the bureau a short time ago.

Traveling Tractor School Under Way

Advance Rumely Co. Carries Instruction to Its Dealers—Prepares for Big Year

CHICAGO, Jan. 28.—The Advance Rumely Co. has on the road at present a school for dealers. This school is to make 12 stops of a week each at the chief branches of this company. The objective is to instruct dealers "in all that the dealer should know about tractors." The company appropriated $100,000 for this work, believing that 1922 was to be a tractor sales year.

In preparation for this school the company prepared an exhibit consisting of 12 carloads of tractors and tractor parts. The exhibit included cutout unit parts and separate crankshafts, disassembled transmission and such fundamental parts. Two of these exhibits were arranged so that the faculty could move from city to city without loss of time.

The faculty includes the service managers, engineers and others from the factory and men loaned by the organizations which make unit parts for this company.

Each of the six days of school work is divided into three sessions, with classes for morning, noon and evening. After the lecture the dealers are taken into a shop or laboratory and shown exactly how each member of the unit part operates. All dealers are required to attend this school and the company paying the expense while there. The roll is called and if the dealer is not present his per diem is not credited to him.

At some time during the school each dealer is required to go into a lot and drive each tractor in the various driving tests. It is believed that any dealer who goes through this course will be able to go on a farm and perform the farming task for the prospect. The instruction is not restricted to driving but includes belt work and other operations that are becoming more popular with tractor owners.

Fenn Finds Truck Outlook Is Bright

CHICAGO, Jan. 30—F. W. Fenn, secretary of the motor truck committee of the National Automobile Chamber of Commerce, has been in Chicago visiting several truck manufacturers in this vicinity. His stop here was a part of a trip throughout the West during which he hopes to visit practically all the truck manufacturers. He has just completed a trip through Michigan and after several days in the Chicago vicinity will go through the states of Wisconsin and Minnesota, and will return to New York after visiting several Canadian factories and shows.

Fenn says he has found an excellent spirit in the truck factories he has visited so far. In all of them there are the signs of the awakening of sales and where the sales department is showing any initiative in seeking business, good results are apparent. At no place has he found that truck demands have developed to the point where sales are to be picked up without effort, but he has found that where an effort has been made to adapt truck transportation to specific business needs, sales are being made.

Everywhere that he has visited, Fenn finds there is a strong interest in bus development and in a number of factories special attention has been given to the development of chassis for transportation on railroad tracks.

COLLECTIVE BUYING BEGUN BY FARMERS

PORT BYRON, ILL., Jan 31—The Co-operative Co., composed of farmers, has endorsed a proposal from the Moline Plow & Tractor Co. for collective buying, and seventy-five farmers have agreed to invest in tractors and certain farm implements. The manufacturers will ship directly to the farmers and the latter will remove the implements from the car to the farm. The secretary of the company will serve as agent for the Moline concern. The new system will reduce the cost to the consumer and stimulate dormant buying among the agriculturists.

Americans Operating Bus Lines in China

WASHINGTON, Jan. 30—A report from Vice-Consul Samuel Sokorin at Kalgan says there are at present five American firms engaged in operating automobile passenger service between Kalgan and Urga in China, and by spring it is expected that this number will be doubled. Hitherto only small motor cars carrying four passengers and a driver have been used in this service, and no attempt has been made to carry valuable freight.

Aside from the question of carrying freight, the designing of a large car for Mongolia is important in that it will mean an increased passenger traffic, as the larger cars could carry seven or eight passengers on each trip.

SEIBERLING ON COAST

LOS ANGELES, Jan. 30—Announcement is made by the Seiberling Rubber Co. of Akron, Ohio, that Los Angeles will be headquarters for the Pacific Coast States. George Bellis has been named branch manager here, F. B. Hesse, San Francisco; C. B. Reynolds, Portland; M. H. Anderson, Salt Lake City, and J. M. Watson, Denver. Bellis is a former manager of the Goodyear branch here. J. E. Argus has been named coast manager.

Bank Thinks Prices Nearly Stabilized

Chicago Federal Reserve Says Manufacturers Move Cautiously

CHICAGO, Jan. 30—Discussing automobile production and shipments, the January review of business conditions compiled by the Federal Reserve Bank of Chicago says:

"While the number of visitors at the eastern automobile show indicates increased interest in the motor car, the improvement in actual business looked for with the turn of the year has not yet materialized. The Chicago and other western automobile shows now under way or approaching, are relied upon by manufacturers to give an indication of the probable absorption of cars during the spring months.

"Manufacturers are moving cautiously. Dealers throughout the country are not in a strong financial position. The decline in price of new automobiles has demoralized the second-hand car market, and as a result of the decline in used-car prices, dealers have been compelled to absorb severe losses on cars that have been traded in.

"There is a more widespread feeling among manufacturers than has existed for some time, that prices are now settling to a level on which they are likely to stabilize, for the season at least. Cuts made since Christmas have been fairly general, although prices with few exceptions are not quite down to pre-war levels. These exceptions, however, are offset to some extent by improvements and increased equipment on the car. Inventories show a considerable decrease."

Kansas City Credit Easier

KANSAS CITY, Jan. 30—The following statement in reference to the financial situation in this district is made in the monthly review of conditions prepared by the Federal Reserve Bank of Kansas City.

"The financial situation at the beginning of 1922 may be described as easier than for several months past. Indebtedness is still heavy and there is a considerable volume of frozen loans, though it is noted that there has been continued slow but steady liquidation. Discount rates on short time paper are the lowest in several years and the tendency is toward lower interest rates on long time loans. Lack of an outlet for foreign investments is bringing outside money into the district which is used largely for liquidating industrial loans and giving industries a fresh start, but little is going on in the way of industrial expansion at this time. The agricultural and livestock interests are gradually being helped by loans by banks out of their own funds or borrowings from the Federal Reserve Bank, while the War Finance Corporation is approving loans for agriculture and livestock.

Harvester Truck Plant to Be Built

McCormick States Work at Fort Wayne Will Be Started by March 15

FORT WAYNE, IND., Jan. 30—Work on the construction of the truck plant of the International Harvester Co., in this city, will start on or before March 15. This is the message personally delivered by Cyrus F. McCormick, Jr., president of the Harvester company, at the annual meeting of the stockholders of the Greater Fort Wayne Development Co., which was organized to erect homes to house the workers at the plant. The contracts for the erection of the plant were made in June, 1920, but the construction work was postponed from time to time owing to business conditions.

In making his announcement McCormick said that plans for the plant indicate that in time it will be the largest of its kind in the world, and also declared that action has been taken to make the buildings and grounds a beauty spot in the way of factory construction. Parkways, drives and landscaping of the grounds will be undertaken. The buildings will all be of stucco design.

Operating Within Year

McCormick told the stockholders of the local corporation that while he did not want the action here to be regarded as an indication of great optimism as to future business conditions in the nation, the directors of the Harvester company had decided that all pledges made should be carried out to the letter, even though a wait of a few months more for the starting of the work would be beneficial.

Much of the preliminary work in connection with the big plant has already been done. It is expected that the factory will be in operation and turning out motor trucks within a period of twelve months.

Officers of the Greater Fort Wayne Development Company were re-elected. The development company's assets are now $1,071,869.59.

To Discuss Roads at Tractor Show

MINNEAPOLIS, Jan. 30—A special program treating the application of tractors for road building work has been arranged by the Minneapolis section of the Society of Automotive Engineers for Wednesday afternoon, Feb. 8, in connection with the tractor show in this city.

There will be a technical meeting Thursday at which subjects relating to tractors on the farm will be discussed. A dinner will be given Thursday evening at the Hotel Radisson and the speakers will include E. G. Quamme, president of the Federal Land Bank of St. Paul, and James R. Howard, president of the American Farm Bureau Federation.

The program for the technical session follows:

WED., Feb. 8, 2 p.m.
- Minnesota Road System—C. M. Babcock.
- Road Building Machinery.
- Road Maintenance.
- Motion Pictures of Tractors in Road Construction.

THURS., Feb. 9, 2 p.m.
- Relative Tractor and Plow Reactions of Various Hitches—O. B. Zimmerman and T. G. Sewall.
- The Relation of the Tractor to the Farm Implement—G. Douglas Jones.
- The Possibilities of Standardization in the Tractor Field—P. M. Heldt.

General Motors Has 70,504 Stockholders

NEW YORK, Jan. 31—The number of General Motors Corp. stockholders increased 3367 during the last quarter of 1921. The total now is 70,504, an increase of 21,469 over a year ago. The common stockholders reach a total of 48,348.

The corporation is sending to all its stockholders a pamphlet telling them something of this group of accessory companies which make, market and service essential motor car equipment. The products of this group of companies include electric starting, lighting and ignition systems; warning signals, ball bearings; roller bearings; radiators; rims; cold rolled and also cold drawn steel.

These products are standard equipment upon representative makes of passenger cars, trucks, tractors and engines. Some of them find a wide variety of uses outside the automotive industry. The companies mentioned include the Dayton Engineering Laboratories Co., Remy Electric Co., Hyatt Roller Bearing Co., New Departure Mfg. Co., Harrison Radiator Corp., Jaxon Steel Products Corp., Klaxon Co., United Motors Service Co., Delco Light Co., Lancaster Steel Products Corp. and the Dayton Wright Co.

A. R. Warner Is Dead; Pioneer in Industry

CLEVELAND, Jan. 30—Albert R. Warner, for years an official of the White Co. and known in the motor industry of the country as one of the leaders, was buried in the Lake View Cemetery here after impressive services, in which many of the leaders in the automobile industry of the Forest City participated. Warner died at the age of 54, after a stroke of apoplexy.

For seventeen years he had been with the White company in an official capacity. His service played an important part in the upbuilding of that corporation. Until recently he had been a member of the auxiliary board of the Guardian Savings & Trust Co.; a director of the Cleveland National Bank and of the Universal Crane Co. and the Rubay Co., which builds automobile bodies.

Burke Will Direct Sales for Peerless

Former Sheridan Head Succeeds Cunliffe, Who Becomes Philadelphia Distributor

CLEVELAND, Jan. 30—C. R. Cunliffe has resigned as general sales manager of the Peerless Motor Car Co. to take over control of the Girard Automobile Co., Peerless distributor in Philadelphia. He will be succeeded by D. A. Burke as general sales manager of Peerless.

Burke is one of the veterans of the automotive industry. In 1913 he became branch manager in Cleveland for the Buick Motor Co. and later was transferred to the factory at Flint, where he worked for two years under R. H. Collins, who then was general sales manager and who now is at the head of the Peerless company. Burke was placed in charge of the Buick branch in Chicago in 1916. He remained there until 1919, when he was commissioned by W. C. Durant to design the Sheridan car, in which he embodied many of his own ideas.

Served with Durant

When the Sheridan Motor Car Co. was organized as a division of the General Motors Corp., Burke was made president and general manager. Upon the sale of the Sheridan division to Durant interests, Burke was made general manager of the Durant Motor Car Co. of Indiana. He resigned that position two or three months ago, although he retained a stock interest in the company. His alliance with Collins is another indication of the close relations between the latter and Durant.

Cunliffe retired Aug. 1 as manager of the Chicago branch of the Cadillac Motor Car Co. to become associated with Collins. His appointment as sales manager of the Peerless company was announced a few weeks later. Before going to Chicago Cunliffe was manager of the Cadillac branch in Philadelphia.

Ahlberg Establishes Ten New Branches

CHICAGO, Jan. 30—The Ahlberg Bearing Co., manufacturer and distributor of new high grade ball and roller bearings and manufacturer of Ahlberg ground bearings, announces the opening of ten additional branches, which makes a total of thirty-four branches owned and operated by this company. The new branches are located in the following cities: Baltimore, Buffalo, Columbus, Dallas, Duluth, Indianapolis, Newark, Toledo, Washington, D. C., Youngstown, Ohio.

It is the intention of this company to establish a considerable number of branches in addition to those already in operation, so that customers can avail themselves of its services with very little delay.

Ford Seeking Real Executive Talent

Interviews Big Men of Industry About Lincoln Sales and Production

DETROIT, Jan. 30—Henry Ford's purchase of the Lincoln Motor Co. on Feb. 4, which is considered in this city to be practically a certainty, promises to bring in its train one of the greatest reassemblages of executive talent that the industry has known.

Throughout the deal Ford has acted with the almost certain knowledge that the men he requires to operate the property are willing to join him. Several conferences have been held at which the views of these men on the operation of the plant have been heard and Ford is said to be thoroughly in accord.

The influence of the Lelands in the new control will be nominal, though it is definitely known that they will have a place in the new organization. There will be a new president and general manager and production will be in the hands of an executive of the Ford school. The sales will be under the direction of one of the highest trained specialists in the industry.

That there will be no bid for the property from stockholder interests is gleaned from the fact that the heaviest holders are content to accept a stock loss to realize on their notes.

There are reports, apparently well founded, that Ford is prepared to go to the assistance of at least one other company, producing a high class car, which is said to be in financial difficulties for much the same causes as those which involved the Lelands.

Detroit is gossiping more avidly than ever over the plans of Ford and confidently believes that he will become almost as important a factor in the higher price classes as he now is in the lowest class.

Toronto-Durant Co. Headed by Wallberg

NEW YORK, Jan. 31—Durant Motors of Canada, Ltd., will begin production before March 1 in its plant at Leaside, a suburb of Toronto. Both four and six-cylinder cars will be produced, but the output will be confined for the present to the four-cylinder models.

The Toronto-Durant Co. has been organized with E. A. Wallberg of Toronto as president, to distribute the line in the Toronto territory. Wallberg is a financier and a civil engineer, and is interested in Durant Motors of Canada. The Toronto distributing company will be located in an addition to the King Edward Hotel and will open next week.

FRONT DRIVE MOTORS PRODUCING

KANSAS CITY, Jan. 30—The Front Drive Motor Co., a Missouri corporation, capitalized at $200,000, with main offices in this city, is increasing its capitalization to $1,500,000, with $600,000 paid in. The company is now in production, one car having been delivered in Kansas City, and regular shipments being scheduled, beginning in February, from the Szekely Engineering Co., Moline, Ill. The company is now disposing of territorial distributing agencies. Arrangements are being made for a Kansas City factory.

Broadwell Appoints M. A. M. A. Committees

NEW YORK, Jan. 31—President E. H. Broadwell, president of the Motor and Accessory Manufacturers Association, has announced the following committee appointments for the year:

Executive committee: E. H. Broadwell, Fisk Rubber Co., Chicopee Falls, C. E. Thompson, Steel Products Co., Cleveland; W. O. Rutherford, B. F. Goodrich Co., Akron; G. Brewer Griffin, Westinghouse Electric & Mfg. Co., Springfield, Mass.; C. H. L. Flintermann, Detroit Pressed Steel Co., Detroit.

Finance committee: E. H. Broadwell, chairman, Fisk Rubber Co., Chicopee Falls; C. E. Thompson, Steel Products Co., Cleveland; E. P. Hammond, Gemmer Mfg. Co., Detroit; W. O. Rutherford, B. F. Goodrich Co., Akron; G. Brewer Griffin, Westinghouse Electric & Mfg. Co., Springfield, Mass.; A. W. Copland, Detroit Gear & Machine Co., Detroit; J. M. McComb, Crucible Steel Co. of America, Pittsburgh.

G. M. C. Truck Takes Over Atlanta Branch

PONTIAC, MICH., Jan. 31—A direct factory branch of the General Motors Truck Co. has been opened in Atlanta for the distribution, sale and service of GMC trucks in the Southeastern States. This branch will take the place of the Southeastern GMC Truck Co. and will occupy the same building.

T. K. Johnson, for the last four years general manager of the Southeastern GMC Truck Co., has been appointed manager of the factory branch.

In addition, the General Motors Truck Co. will take over the Charlotte, N. C., branch of the Southeastern GMC Truck Co., and will operate it also as a factory branch under the supervision of the branch in Atlanta.

LOCOMOBILE RECEIVES AWARD

CHICAGO, Jan. 30—A Locomobile steam car built in 1899 and owned by John Barry of Dayton, Ohio, won the first prize offered by the National Automobile Chamber of Commerce for the oldest car in the United States still in running condition. The second prize was awarded to a 1900 Oldsmobile driven by a gasoline engine. There were 200 entries in the contest including twenty-one Oldsmobiles and three Cadillacs. It was brought out that the seventh and ninth Oldsmobiles manufactured still are running.

Finance Men Seek Legislative Reform

Committee Named by National Association—Six Locals Now Organized

NEW YORK, Jan. 30—A legislative committee which will work in harmony with the various companies included in its membership was appointed at the meeting of the directors of the National Association of Automobile Financing companies held in this city. The committee, named by Fred A. Webber, Jr., president of the association, is composed of H. W. Ritter, W. E. Hiller and A. A. Ross. It was contended at the meeting that reforms are needed in the laws of various states or in the interpretation of them. The locals of the association will be expected to co-operate with the national organization in carrying on this work.

It is felt that while many of the problems are peculiar to the individual states, co-operative action would result in amendments to present statutes which would afford all the companies in the automobile financing business greater protection. Most of these companies are doing business in all states and for that reason all of them are vitally interested.

It was reported that locals in Chicago, Pittsburgh, New York, Indianapolis, St. Louis and Rochester now are affiliated with the national organization. John B. Perlee of Chicago was appointed chairman of the membership committee. Each company which is a member of the association will be asked to take three memberships in the local, consisting of an executive, counsel and credit man.

The need for publicity also was considered and a committee headed by C. L. Hemphill of New York was named.

Quarterly meetings will be held by the national association. The next will be in St. Louis in April and the July session will be held in Pittsburgh.

Martin-Parry to Produce Special Bodies for Willys

INDIANAPOLIS, Jan. 25—The Indianapolis plant of the Martin-Parry Corp. of York, Pa., will make the greater part of the order for 40,000 truck bodies of a special type placed by the Willys-Overland Co. The bodies are equipped with new labor and time-saving devices. It is said that the Martin-Parry Company also has working agreements with Chevrolet and Ford companies and is figuring on a contract with Buick.

Chaplin Spahn, general manager of the Indianapolis branch of the corporation, states that plans are now being considered for the construction of a large lumber mill in Louisiana where lumber used for body construction would be cut and trimmed before being sent north. The mill, Spahn says, would probably be large enough to cut and trim four to five million feet annually.

Ball Bearing Stock Is Retained by Nice

Court Orders Voting Trust Certificates Cancelled—Continues As Independent

NEW YORK, Jan. 30—A suit involving a novel question as to the power of the Federal Court to restrain a proceeding in the State courts of Pennsylvania and whether the Nice Ball Bearing Co. of Philadelphia, one of the leading independent manufacturers of ball bearings, was to be absorbed by its leading competitor, was settled here while the case was pending here in the United States Circuit Court of Appeals.

Announcement of the settlement was made by the attorneys, who preferred not to discuss the terms. The plaintiffs in the case were Budd G. Nice, president of the Nice company, and other members of his family, who controlled it. The suit demanded the return of voting trust certificates representing the entire stock of the Nice Ball Bearing Co. from the defendant, Franklin B. Kirkbride, banker, of 7 Wall Street, who during the litigation was president of the S. K. F. Industries, which a few years ago absorbed the Atlas Ball Bearing Co., the Hess Bright Mfg. Co., ball bearing manufacturers of Philadelphia, the S. K. F. Ball Bearing Co. of Hartford, Conn., and the Hubbard Machine Co.

By the settlement, which was effected after months of conferences between counsel for both sides, the Nice family retains all the stock of its company, representing a $2,000,000 plant in Philadelphia. The voting trust certificates held by Kirkbride are cancelled and the Nice company continues as an independent concern. The settlement not only ends the appeals here but several suits pending in Philadelphia and litigation which promised to continue for years, due to the novel questions which would have been carried to the United States Supreme Court.

Kirkbride Wins Victory

While the cases were pending Kirkbride won a victory in the Supreme Court of Pennsylvania, but the plaintiffs obtained an equally important victory here by a decision of Federal Judge Augustus N. Hand.

The history of the case, which is as interesting in its facts as in the legal points involved, is disclosed in the record of the appeal filed in the United States Circuit Court of Appeals here. As shown by the opinion of Judge Rogers, of the Philadelphia Court of Common Pleas, the Nice company desired to extend its plant in 1917 because of war conditions and increased business, and contracted with William Steele & Sons Co. for additional factory buildings on a "cost-plus" basis. The final price charged by the builder was almost double the original estimate. Because of the increased cost, the Nice company could not meet its payments to the contractors, who sued.

Judge Rogers said in his opinion that "Steele & Co. evidently wanted their money and forced a hard bargain." Although the company's prospects for profits from future business were bright and were later fulfilled, the company found itself embarrassed as a result of the Steele action and was forced to avoid the consequences of the suit.

The Nice company agreed to transfer its real estate to the Steele company as security, and to lease it from the contractors for $5,000 a month, which was to be applied on the claim. This arrangement was objected to by certain creditors. A creditors' agreement was made under which the contractors assigned their rights upon payment of the claim. The testimony showed that Prytz, then president of the S. K. F. Industries, was advised of the difficulties of the Nice company and turned the matter over to Kirkbride, who agreed to furnish the necessary capital.

Federal Court Allegations

Allegations in the suit in the Federal Court here were that the necessary capital was then furnished, and voting trust certificates for the stock of the Nice company were delivered to Kirkbride. Kirkbride refused to enter into a reorganization plan to preserve the independence of the Nice company. Suit was then brought for the return of the voting trust certificates, at which time payment of the entire sum due Kirkbride was tendered by the Nice company.

The plaintiffs in the action brought in the United States District Court here included all but two stockholders who had brought a similar suit in Pennsylvania in which they were defeated. While proceedings were pending here, Kirkbride applied in Philadelphia for an order compelling the exchange of the voting trust certificates held by him for all the stock of the company then held by the voting trustees and for an injunction against Budd G. Nice and the other plaintiffs in the suit here. Before this case was heard in Philadelphia the plaintiffs here asked Judge Hand for an order restraining Kirkbride from interfering with the suit here, which Judge Hand granted.

These appeals are now dismissed by the settlement of the case, the receivers have been discharged, and control remains in the hands of Budd G. Nice and members of his family. Nice continues as president.

CADILLAC NEARS 100 DAILY

DETROIT, Jan. 28—Production at the Cadillac Motor Car Co. plant is running close to 100 daily as a result of orders received at the New York and other shows since Jan. 1. Unusual stimulus has been experienced, officials declare, due in large part to the combination of lowered price and improved design of the new models. Four sales were reported in the first two hours of the Detroit show and consistent buying was reported throughout the week.

1000 Membership Is Aim of N.A.D.A.

Sets Out at Annual Meeting on Reorganized Career—Hay Chosen President

CHICAGO, Jan. 31—The National Automobile Dealers Association started today on its reorganized career with membership dues running from $50 to $250 a year, instead of $10, the rate which has prevailed except for a few $100 sustaining members since its organization four years ago. The goal is 1000 members or more and the membership qualifications are such that the appellation "One of a Thousand" is to be applied to dealers earning the right to display the Association emblem.

The new membership plan, approved by the directors several weeks ago, was adopted by the unanimous vote of the annual convention, which was poorly attended but which had a remarkably practical business program. At its close, Thomas J. Hay, Chicago Chandler and Cleveland distributor, was elected president, succeeding Jesse A. Smith, Buick distributor in Milwaukee. The other new officers are William L. Hughson, Ford dealer in San Francisco, first vice-president; John H. Butler, Dodge Brothers distributor in Kansas City, second vice-president; F. W. A. Vesper, Buick distributor in St. Louis, treasurer.

Counter attractions such as the Chicago show and manufacturers' meetings with their dealers kept the attendance down but it was significant that the men present and supporting the new N. A. D. A. plan were largely of the substantial distributor type. The experience suggested that future meetings be held at other times than show week.

Discuss Profits

Frederick Pierce of New York, a sales authority, presented a vivid word and chart picture of the fundamentals of salesmanship, supplementing it with the observations that price should be "forever and eternally secondary." James MacGregor, St. Louis Cadillac distributor, analyzed a dealer's sales from an accounting standpoint, showing how excessive cost of merchandising and paying too much for used cars had cut profits heavily in 1917 and again almost to nothing in 1921.

The general sentiment of the meeting was for "less business and more profits in 1922" to be brought about by refusal to sell new cars at the expense of losses on used cars taken in trade.

HIGHWAY SCHOOL POPULAR

LAFAYETTE, IND., Jan. 30—The eighth annual road school now being held by Purdue University for highway builders of the State of Indiana has attracted a large number of road builders. The registration has passed the 275 mark and it is expected that more than 300 will have taken part or all of the course.

Exclusive Dealer Movement Growing

Factory Sales Managers Busy at Chicago Expanding Organizations

CHICAGO, Feb. 2—Sales and advertising men are prominent at the Chicago show and will put in a busy week. Some of them are actively at work in their exhibits directing sales efforts, but for the most part they are devoting their effort to strengthening the dealer organizations in the territory. The movement toward exclusive dealerships looms up more strongly with the introduction of the lighter models and many realignments of territory are in the making.

The new $1,000 Franklin air-cooled car was shown to dealers in the Mid-West district at the Congress Wednesday noon.

President H. M. Jewett of the Paige-Detroit Motor Car Co. will present to his dealers the new Jewett car at a meeting Thursday evening at the Blackstone. This is the light six which will sell in the $1,000 class.

Velie dealers met at the Drake Wednesday when the new engine and car models were shown. The mechanical improvements were carefully detailed as important to developing volume business.

Jordan dealers were addressed by President Edward S. Jordan and General Sales Manager W. B. Riley at a meeting Thursday noon at the University Club.

The new Chandler line was presented to the dealers of the Mid-West territory at a luncheon meeting Tuesday noon at the Congress.

The Overland dealers' meeting was staged at noon Wednesday in the Congress, with President John N. Willys, Vice-President Walter P. Chrysler and Sales Manager A. C. Barber as speakers. As in New York, the factory organization will be presented to dealers with a view to establishing closer contacts and co-operation.

The Oldsmobile dinner was held at the Congress Wednesday at 7 p. m. President A. B. C. Hardy and a number of General Motors executives spoke.

Gains in California Made by Few Lines

LOS ANGELES, Jan. 30—A recapitulation of the motor car business in southern California during 1921 shows an increase in sales of 8000 new cars over 1920. This was a gain of 18 per cent. In the city of Los Angeles the gain was 21 per cent. The total registration of new cars for the year was 51,226 and the total of all cars of all makes and models was 341,329. The proportion of cars to population will be as 1 to 5. Southern California has ten counties, but some are very sparsely inhabited. Approximately one-third of all the cars in the southern section of the State are owned in Los Angeles.

Dealers have cause for giving serious consideration to the 1921 registration figures. Although a gain of 8000 new cars was made this is more than offset by the increase in the sale of Ford cars alone, which totaled 8019. Of the total of 341,329 cars of all makes registered, 115,123 were Fords. The situation indicates that when all makes of cars, exclusive of Fords, are considered, there was no increase in business over the previous year.

The year's business showed conclusively that the better known makes of cars were the only ones to make material progress. In the main, the less popular makes did not do as well as in 1920. The leaders were: Buick, 3349; Chevrolet, 5306; Studebaker, 4131; Dodge, 3615; Overland, 1345; Oldsmobile, 1122; Nash, 944; Oakland, 710; Maxwell, 856; Hupmobile, 801. Among the higher grade cars, the Cadillac with 562 outstripped the entire field. Among the heavy-duty trucks the Mack led with 276, and among the commercial cars, excluding the Ford, the Dodge was first with 521.

Sales Are Stimulated in Columbus District

COLUMBUS, Jan. 30—A decided improvement in the demand for passenger cars has been noted by Columbus dealers and jobbers since the middle of January. This is attributed partly to the New York show and also by the better industrial conditions which are prevailing. There has been some improvement in the employment situation in Columbus and this is reflected in the demand for motor vehicles.

The bulk of the demand is for cars ranging in price from $800 to $1,500. Yet there is a fair demand for higher priced cars and in fact all classes of vehicles are showing improvement. Recent price declines are given credit for a large part of the improvement and the movement toward stabilization is going on.

TEXAS SALES INCREASE

DALLAS, Jan. 30—There appeared to be a continued improvement in the automobile business in Texas this week. Dallas retailers found sales 5 per cent better than the previous week and Fort Worth dealers were selling 10 per cent more. Houston retailers said the increase was about 5 per cent over the preceding week and Galveston said business was holding its own. Panhandle dealers were selling more cars and trucks and Waco retailers reported slight increases. Retailers in a half dozen small towns in east Texas said business showed a decrease.

BOSTON SALES BETTER

BOSTON, Jan. 30—Boston motor car dealers report that retail business showed a decided turn for the better in January and that they are selling both new and used cars. Wholesale orders also are picking up. With the advent of the 1922 season comes the annual list of changes which occur about this time.

Many Truck Laws Rule California

Patchwork Results Through Each County Adopting Its Own Regulations

LOS ANGELES, Jan. 28.—Defeated in their purpose to reduce the weights allowed motor vehicles on the highways and increase the fees exacted the county supervisors of this State have set about to accomplish their purpose in another way. They are passing separate ordinances in each county lowering the weights from those permitted by State law. The result is that California is fast becoming a crazy quilt proposition when long-distance motor shipping is concerned. Between here and San Francisco it is necessary to traverse ten counties and eight of them have different ordinances affecting weights.

Authorities Hurt Industry

The State law gives supervisors the right to require lower weights on county roads than those permitted on State highways. Every time a truck leaves a State highway it gets on a county road. Some supervisors have assumed jurisdiction over the State highway and a test case now is in the courts to settle the controversy. In other counties the weight allowed on bridges is so low as to interfere seriously with truck operation. Truck shipping is one of the chief transportation assets of California, but under the guise of damage to the roads, urged on by railroad protagonists, the road authorities are throttling the industry.

Hardest Blow Delivered

What is regarded as the hardest blow yet delivered came last week when the supervisors of Los Angeles county passed an ordinance allowing four-wheel vehicles 24,000 lb. gross weight; six-wheel vehicles, 32,000 lb., and any combination of truck and trailer, 40,000 lb. The ordinance stipulates no more than one trailer. The State law allows two trailers. It is estimated by operators that the reduction in weights will result in an increased charge of 30 per cent to truck shippers. Los Angeles county has more trucks engaged in miscellaneous freight operation than any in the State. The county has been governed in the past by the State law which permitted 30,000 lb. on four wheels, 40,000 lb. on six wheels and set no other limit except 700 lb. per inch of tire width. Los Angeles county has reduced the latter figure to 650 lb. per inch.

BODY PLANT COMPLETED

HERMITAGE, ARK., Jan. 31—The Hermitage Body Works plant here has just been completed and will soon be placed in operation. Automobile and truck bodies will be manufactured. The first carload will be shipped to Beaumont, Tex. H. G. Turner of San Antonio, Tex., is manager of the plant.

Justice Officials Probe Bosch Sale

Three Channels of Investigation Indicated—Plant Operations Are Uninterrupted

BOSTON, Jan. 31—The scope of the Department of Justice investigation of the sale of the Bosch Magneto Co. was learned coincident with the arrival here of Thomas W. Miller, Alien Property Custodian, with Government records of the transfer. The documents were discussed at a conference of Federal attorneys held with the view to preparing the information contained in them for presentation to a Federal Grand Jury.

Officials indicated that the investigation would follow three main channels. The first of these is the sale of the Bosch Magneto Co. by A. Mitchell Palmer, as Alien Property Custodian, to Martin E. Kern. In this connection, it was said, the question of Kern's citizenship at the time of the transfer is involved.

Army Contracts Involved

The Government is interested, also, officials said, in looking into the Bosch company's contracts with the army air service, involving $420,000.

The third phase under investigation, it was said, involves income tax returns filed by the company. Internal revenue agents are understood to be checking up these returns now.

The case will come before the Federal Grand Jury here. John E. Joyce, assistant Federal attorney for the southern New York district, will have charge of the investigation of the sale of the company under the direction of District Attorney Harris.

The case is before the Federal Grand Jury of this district at the present time, as it was summoned for the purpose several weeks ago. After a few sessions the jury was dismissed, subject to call at any time. The delay, it is generally understood, was to give the Government authorities time to check and audit the records of the company and of the Alien Property Custodian.

Sold for $4,500,000

The Bosch property at Chicopee, Mass., was seized in April, 1918, by Palmer as Alien Property Custodian, being sold eight months after to Kern for $4,500,000. Allegations that the property transferred, including stock in other concerns and trademarks, was worth a much larger figure and that something was not right about the sale, were made and investigated when Palmer's nomination as United States Attorney General was before the Senate for confirmation.

Soon after his arrival here, Joyce dropped temporarily the Boston end of his investigation and returned to New York after stating that the entire matter would be transferred to that city.

Federal Attorney Harris disagreed with Joyce as to the transfer. He said that the Boston investigation would not be abandoned and that the records which he had subpœnaed would be sent to New York for examination by officials working on the case there, but would not be released from the custody of the Boston office.

Joyce declared that the investigation was ordered transferred to New York for the sake of convenience.

No Interruption at Plant

SPRINGFIELD, MASS., Feb. 3—Arthur T. Murray, president of the American Bosch Magneto Corp., asserts that there will be no interruption of the production program at the plant on account of the Federal Grand Jury inquiry into the company's affairs. Plans have lately been developed for merchandising the concern's new devices that look to a large increase of output.

Popularity of the battery ignition system has brought a decline of the demand for magnetos for passenger car use, and to meet the changed situation the company has brought out ignition and starting devices, etc., ready to be produced in quantities. He stated that since the plant was acquired by its present owners the manufacturing methods as applied to magnetos had been practically revolutionized by the introduction of a flexible system enabling different sizes of magnetos to be provided to meet diverse requirements. In this way, he said, production of magnetos at the plant was expanded from 100,000 to 340,000 yearly.

Factories in Toledo Feel Effects of Shows

(*Continued from page* 244)

Advance orders for Willys-Knight cars for 1922 delivery have caused officials at the Overland plant to increase their production plans for these cars to twice the number manufactured in the two-year period of 1920 and 1921. The general production plans at the Willys-Overland plant are going forward during the month. The working force has been increased considerably.

Electric Auto-Lite, Champion Spark Plug Co., Tillotson Carburetor Co., Mather Spring Co., are among the companies gradually building up their production to normal. The Bock Bearing Co. is going forward with an increased production schedule.

Dealers report that the generally decreased interest rates by bankers and mortgage companies is also helping along sales.

SCHOLARSHIPS AWARDED

FLINT, MICH., Jan. 30—Free scholarships from the various factories of the city were given 24 honor students of the Flint School of Automobile Trades at the conclusion of the first term recently. The students who received these scholarships for the second term of the school are as follows: Buick Motor Car Co., 10; Chevrolet Motor Co., 4; Flint Varnish & Color Works, Flint Motor Axle Co., and Champion Ignition Co., each 1.

February Opening Briskly at Plants

Executives Express Themselves As Well Satisfied with Results of Shows

DETROIT, Jan. 28—Production in Detroit factories in January was small owing to the late resumption of manufacturing following inventories, closings to effect plant changes and other causes. February will start off briskly on orders resulting from the shows. Factory officials declare themselves well satisfied with the results of the shows to date.

Ford production started late in the month, officials declare. Sales were somewhat increased by the lower prices, but there was no rush of business as on occasions where heavy price cuts were made. This condition, officials said, was expected, as the January cut was made to stabilize business.

Dodge and **Maxwell** have run along smoothly during the month, the former on the basis of its anticipated price cut and the latter filling orders.

Durant is building about 40 cars daily at Lansing and will continue this schedule during February.

Production in the medium price field has been late in starting, though **Hudson** and **Essex** have had a steady flow of business, and **Studebaker** and **Buick** have started production on close to normal figures.

Hupp, Reo and **Paige** are ready to enter heavy production.

Rickenbacker has lined up considerable business at the shows but the factory is still being equipped.

Oakland went into production late in January and expects to build 3800 in February.

Oldsmobile reports good show business and steady progress forward.

Cadillac production is running close to 100 cars daily, which is nearly 100 per cent capacity.

Packard has done little in a productive way during the month, but has thoroughly reorganized and retooled its factory departments in anticipation of a heavy manufacturing schedule in February.

Road Builders Await Lower Concrete Price

DAVENPORT, IOWA, Jan. 30—Eight Mississippi Valley State highway commissions have joined in agreement not to build any more hard-surfaced highways until the price of cement is materially lowered. States in the agreement are Iowa, Kansas, Michigan, Missouri, Minnesota, South Dakota and Wisconsin.

The action will tie up proposed highway work representing expenditures of $200,000,000.

Dodge Announces Its Price Revisions

Touring Car Reduced to $880—Cut of $105 Less Than Generally Expected

NEW YORK, Feb. 1—After having been kept a profound secret for two weeks, the new prices of Dodge cars were telegraphed to dealers early to-day. Not even the largest distributors knew them until they went to work this morning. Many Dodge dealers kept vigil in telegraph offices last night in the hope that they might intercept a telegram containing the information, but none came.

The new prices as compared with the old follow:

	Old Price	New Price
Touring Car	$985	$880
Roadster	935	850
Sedan	1,785	1,440
Coupe	1,585	1,280
Screen Delivery	1,035	880
Panel Delivery	1,135	980

See Stabilizing Effect

The reductions were not so sharp as had been expected generally. The commonly accepted report had been that the price of the touring car would be $775 or $785 and a cut of only $105 came as something of a surprise. The new touring car price of $880 compares with $935 for the Buick, $975 for the FB model Chevrolet, $985 for the Dort, $890 for the Durant four, $895 for the Gardner and $885 for the Maxwell.

It is the belief within the industry that the comparatively small cuts made by Dodge Brothers on their models will have a strong tendency to convince the public that motor car prices have reached their lowest level, for several months to come. This impression was driven home first by the insignificant reductions made by Ford.

No Immediate Buick Cut

The new Dodge prices which are retroactive to Jan. 1, will result in exceedingly keen competition in that class. The price of the new Maxwell touring car is exactly $5 more than the Dodge and the Durant is $10 more. While the differential between the Buick and Dodge is considerably higher, it was said at General Motors headquarters here to-day that there was little probability of another Buick reduction at this time. Durant has guaranteed prices until Aug. 1.

Sales results after the New York show, where the greatest emphasis was placed on prices, seem to have jolted the manufacturing end of the industry into a realization that prices must be stabilized if sales are to be made. Price readjustments expected after the Chicago show failed to materialize.

G. M. TRUCK LISTS REVISED

PONTIAC, MICH., Jan. 30—Changes in prices on several of its models are announced by the General Motors Truck Co. The revisions follow:

	Old Price	New Price
2-ton, Model K 41A	$3,000	
2-ton, Model K 41		$2,775
3½-ton, Model K 71A	4,250	3,950
3½-ton, Model K 71B		4,050
5-ton, Model K 101A	4,650	4,350
5-ton, Model K 101B		4,450

VETERAN TRUCK REDUCED

HULL, QUEBEC, Jan. 30—Eastern Canada Motor Truck Co., Ltd., manufacturer of Veteran trucks, has made reductions on its full line as follows:

	Old Price	New Price
1½-ton	$3,500	$2,699
2-ton	4,000	3,699
3-ton	4,400	4,200
4-ton	5,600	5,395

Ruggles Truck Fixes Price on Two Models

DETROIT, Feb. 1—The Ruggles Motor Truck Co. announces prices of its trucks as follows: 1-ton chassis, $1195; 2-ton, $1795. Only two models are to be built for the present. Production which was started in November has been gaining steadily, the company states, and will reach 100 this month. Distribution is increasing, with a wide area covered, the company finding dealers enthusiastic for its product.

In the 1-ton model there are five optional body types all selling at the same price. The equipment includes an electric starter and electric lights, Continental engine, Spicer drive shaft and joint, Brown-Lipe transmission and Columbia rear axle. The model is equipped with pneumatics 34 x 5.

The 2-ton has a Ruggles 4 x 5 engine, Brown-Lipe four speed transmission, Spicer drive shaft and Ruggles double reduction rear axle. Pneumatic tires are fitted in front and an option on solid or pneumatic tires for the rear is given.

MENOMINEE REDUCES PRICES

CLINTONVILLE, WIS., Jan. 31—Effective immediately the following reductions have been made on various models of Menominee trucks by the Menominee Motor Truck Co:

	Old Price	New Price
1—1¼-ton, Model HT	$2,080	$2,000
1½-ton, Model H	2,725	2,475
2—2½-ton, Model D	3,245	2,875
3½-ton, Model G	4,270	3,800
5-ton, Model J-3	5,450	4,850

KELSEY PRODUCES NEW MODEL

NEWARK, N. J., Jan. 30—The Kelsey Motor Co., which will produce a friction drive car, has announced a new four-cylinder model. The touring car and roadster will sell for $985; the coupe at $1,400, and the sedan at $1,450. The prices of the six-cylinder open model have been reduced from $1,800 to $1,525 and of the enclosed model from $2,700 to $2,175.

JACKSON TOURING CUT

JACKSON, MICH., Jan. 28—The price of the Jackson five-passenger touring model has been lowered from $1,635 to $1,485. Other models remain the same.

Truck Trade Poor In Swedish Market

Germans Flood Country With Own Products and Many Remain at Wharves

STOCKHOLM, Jan. 2 (*By Mail*)—The motor truck market in Sweden is not in the most flourishing condition at the present time.

At the end of the war American truck exporters were very keen for the Swedish market in view of the numerous industries in the country and the consequent need of motor trucks of various sizes. Most of the horses had been exported to Germany, money was plentiful and American made machines were in favor.

German trucks of all kinds and sizes flooded the country in 1920. Most of them had been used in the war but when overhauled completely and fitted with tires they gave good service and at the comparatively low price at which they were quoted many hundreds were sold. Yet, there are several thousand of these German trucks still in Swedish ports in the same condition as when received. One hundred dollars buys one of them, either a 3-ton or 4-ton, and the only additional cost to the purchaser is in the overhauling and fitting of new solid tires. The buyer has a selection of Benz, Bergmanns, Duerkopps, Stoewers and Horchs and once in a while he may find a German Daimler.

Ford Sells for $1,000

Ford is filling 90 per cent of the demand for the 1-ton truck with prices lower than ever. One thousand dollars buys a 1-ton Ford complete, which is half the price quoted a year ago.

To-day the American truck dealers are selling out their stock, taking a substantial loss on each sale. American made trucks which appear to have made their land winnings in Sweden, excepting Fords, are GMC, Garford (particularly in Stockholm), Clydesdale (the west coast of the country), Diamond T, Atterbury (the southern part) and Maxwell. A few Republics, Sterlings and Federals and also a few Four Wheel Drives can be found but not in any great numbers. The lower priced trucks, with the exception of Fords and Maxwells, are meeting with an extremely dull demand.

The market is for a good 2-ton truck with a low loading space and equipped with pneumatic tires. If the manufacturer in America can compete in price and quality he may keep on with the single giant pneumatics on the rear wheels.

HARVEY LOWER

HARVEY, ILL., Jan. 30—Harvey Motor Truck Co. announces reductions on two of its models as follows:

	Old Price	New Price
2-ton, Model WOA	$2,950	$2,650
2½-ton, Model WFA	3,200	2,950

Receivers Appointed For Locomobile Co.

Complete Reorganization Will Be Effected—Policy of Company to Be Continued

BRIDGEPORT, CONN., Feb. 1 — Application for a receiver for the Locomobile Co. was filed with Judge Edwin S. Thomas of the Federal District Court here to-day by attorneys representing the company and several creditors. It was asserted that the interests of both bank and merchandise creditors as well as those of stockholders would be served best by a reorganization through a receivership. The application was granted by Judge Thomas, who appointed Edmund S. Wolf, president of the First National Bank, and Elmer H. Stevens receivers under bonds of $100,000 each.

It was asserted that the company was doing a considerable volume of business and has approximately $500,000 in cash deposits. Officers of the company declared that several reorganization plans were under consideration but that, in any event, the policy of the company to build a limited number of high priced cars would be continued.

To Put Plant on Sound Basis

Elmer H. Havens, president of the company, made the following statement in reference to receivership proceedings:

"The banking and merchandise interests and the present officers of the Locomobile Co. are in agreement that a receivership is the best solution to the problems of the company. It is a natural step toward a proper reorganization that should make possible the operation of the Locomobile plant upon a sound financial basis.

"Last fall, when the Locomobile Co. terminated a contract with Hare's Motors, Inc., under which the latter had operated the Locomobile Co.'s business, the plant was heavily obligated in bank loans and merchandise bills. While plans were then under way for a receivership, it was hoped that this step might be averted and a reorganization effected.

"The New York banking interests and other creditors asked me to assume the administration of the plant. My personal interest in the Locomobile as a Bridgeport institution impelled me, at a considerable personal sacrifice, to accept this responsibility.

Several Plans Considered

"Since then we have been able to line up many of the old Locomobile organization in our renewed activities. We have lowered the price of our various models on an average of $1,000 and have been able to get more than our share of business in the quality motor car field. Although, owing to the heavy burdens we have assumed our progress has been slow, it has been steady. We have decided, however, that the best means of preserving the Locomobile as an institution, is the receivership.

"This will enable us to carry out one of several plans, through which a complete reorganization will be effected. I am justified in stating very definitely that whichever proposed alternative is followed the familiar policies of the Locomobile Co. will be preserved.

"Personally, I have great faith in the Locomobile. I believe the prestige it has earned the world over, supported by the enthusiastic specialists who have developed it and the loyal workmen who build it, insure its future. The Locomobile is an institution; the ownership of the plant is merely a detail."

Senate of New Jersey Increases Truck Fees

TRENTON, Jan. 31—The Senate today passed by a 13 to 7 vote the bill of Majority Leader White increasing fees for motor trucks of more than 13,000 lb. gross weight and capacity. The fee graduates from $55 for 13,000 lb. trucks to $270 for trucks of 30,000 lb.

Senator Parry said that there was considerable opposition in Essex to the bill. He said that the motor truck industry claimed such high fees would drive big trucks out of business.

G. M. in Canada Builds 80 Cars Daily for Export

NEW YORK, Feb. 1—A production of about eighty cars per day is being maintained by the Oshawa, Canada, plant of the General Motors Corp. for the account of the General Motors Export Corp., this number of cars going through the factory for current overseas sales.

In outlining the increased foreign business that has come to General Motors within the last few months, J. D. Mooney, vice-president in charge of the export company, stated that present export sales indicated a large increase over 1921, with the cars moving to Australia, Argentina, Brazil, South Africa, Egypt, India, the United Kingdom and other parts of the world. The output of eighty cars daily was entirely for shipments outside of the United States and Canada, it was made clear.

General Motors began making all foreign shipments of Buicks and Chevrolets from Oshawa in November. Shipments of Cadillac cars to export markets are being maintained from the United States.

FORD WANTS CORN ALCOHOL

DETROIT, Feb. 1—A suggestion that Congress enact legislation which would permit the establishment of manufacturing plants to manufacture commercial alcohol from the surplus supply of corn in order that gasoline may be conserved has been made by Henry Ford. It is contended by Ford that farmers have millions of bushels of corn on hand, which there is no prospect to market and that it could be used to advantage in making alcohol which would supply a substitute for shale oil products. Ford has been experimenting for some time on potatoes.

Ford Dealers May Take on Lincoln

Advised Unofficially That Two Sales Organizations Will Be Closely Aligned

CHICAGO, Feb. 1—There has been much speculation among Ford dealers at the Chicago show concerning what part they will play in Henry Ford's plans for the distribution of the Lincoln car. It is understood they have been informed unofficially that the Lincoln sales organization will be made a part of the Ford organization and that in places where there are no Lincoln agencies, Ford dealers will be expected to take on the sale of the car.

W. A. Ryan, general sales manager of the Ford company, denied reports that each Ford dealer would be expected to take one car after Ford gets control of the Lincoln at the receiver's sale Saturday. This would give a production basis of at least 8000 in the operation of the Lincoln factory.

Ford dealers have been led to believe that the Ford Motor Co. will take over the Lincoln plant and run it as a unit of the Ford organization. The belief among these dealers is that the price of the Lincoln will be reduced even more sharply than has been expected. It is said to be the purpose of Ford to revise production methods so that the chassis and bodies can go through the plant as stock jobs rather than as custom jobs, which has been the practice in the past.

Court Restricts Using "Hudson" Name on Tires

NEW YORK, Feb. 1—Judge Leonard Hand of the Federal District Court has granted the Hudson Tire Co., Inc., of Newark, N. J., an injunction restraining the Hudson Tire & Rubber Corp. of Yonkers, N. Y., from using the word "Hudson" on its tires. This injunction makes permanent the temporary order granted in July, 1921.

The plaintiff has been in business since 1911, but the defendant began operations in 1920. It claimed the right to use the name "Hudson" because it was a geographic name, and it also contended the the Hudson Tire Co., Inc., as a New Jersey corporation, could not restrain a New York corporation from using the name under which it had been organized under the laws of New York.

OLD TIMERS MEET IN CHICAGO

CHICAGO, Feb. 1—Six hundred Old Timers attended the annual Chicago banquet last night at the Congress Hotel. Although no speeches were on the program and the meeting was given over to good fellowship, the Old Timers called for speeches from the retiring president, Albert Champion, and Captain Eddie Rickenbacker.

MEN OF THE INDUSTRY

John V. Mowe, general sales manager of the Kelly-Springfield Tire Co., has been elected vice-president of that company. He joined the organization Jan. 1, 1915, as assistant general sales manager and five years later was made general sales manager, when the sales department was moved to New York. Before entering the rubber industry he was in the wholesale wooden ware business in Chicago. He sold his interest in 1906 and joined the Firestone Tire & Rubber Co. at the Chicago branch and later was manager of the Philadelphia and Detroit branches. He went with the Goodyear Tire & Rubber Co. as a special representative in 1913 and remained there two years.

H. J. Edwards who resigned in August as manager of the Elyria branch of the Willys-Overland Co., where all the engines for Willys-Knight cars have been made, is now at work at the plant of the recently reorganized Standard Steel Motor Car Co. Edwards is one of the pioneer designers of the automotive industry. He designed the Stoddard-Dayton car and in 1911 designed the Edwards-Knight engine and established a factory in New Jersey. When his engine rights were purchased by John N. Willys, Edwards went with the Willys-Overland Co.

Ernest N. Culver has been appointed president and general manager of the Willys-Overland Pacific Co. with headquarters at Los Angeles. He has been associated with the Willys-Overland organization for a number of years, latterly as assistant sales manager. Culver succeeds **Frank C. Riggs** who retains his title of vice-president of the Pacific company but will limit his activities to the management of the Portland branch.

Alfred C. Rantsch, formerly with the Doehler Die Casting Co., has been appointed sales manager in charge of the eastern territory for the Soss Mfg. Co., makers of die castings in zinc base and aluminum alloys. **Albert G. Gruss,** formerly superintendent of the Doehler Die Casting Co., has become production manager in the die casting division of the Soss company.

H. A. Neill, for the last five years manager of the Philadelphia branch of the General Motors Truck Co., has been transferred to the factory sales staff. He will be succeeded in Philadelphia by **F. B. Tyler,** who has been connected with the truck industry for several years. Neill was manager of the factory branch at Kansas City for some time.

E. N. Culver, who has been assistant sales manager of Willys-Overland Corporation, left to-night for Los Angeles, where he will make his headquarters as president of the Willys-Overland Pacific Co. Culver will direct Overland business on the coast with branches in San Francisco, Fresno, Portland, Seattle and Spokane.

Harold B. Thorne has been elected a vice-president of the Pierce Oil Corp. and has been assigned the care of its finances. Thorne has had a long experience as a banker. After serving several years as vice-president of the Bankers Trust Co. he was elected vice-president of the Metropolitan Trust Co. of New York.

Ralph S. Wiltrout is general manager of the Ogren Motor Car Co., Milwaukee with **Foster D. Miller** as sales and advertising manager. **M. R. Elliott** is engineer. Wiltrout was formerly with the Stewart-Warner Speedometer Corp., the Crown-Elkhart Motor Corp. and Huffman Bros. Motor Truck Co.

F. M. Root, formerly with B. F. Goodrich Co.'s Chicago branch, has taken over the Chicago branch of the Victor Rubber Co. and will make his headquarters at 1720 South Michigan Avenue. His territory comprises Illinois, Iowa, Wisconsin and parts of Michigan and Indiana.

Harold L. Arnold, who has been distributor of Hudson cars in California, has signed a contract for the distribution, on the Pacific coast, of Woodbury tires to be manufactured in Chicago by a new company which is understood to have very strong financial backing.

N. C. Berrend, for several years identified with the automobile accessory business and most recently sales manager of Jorgenson Manufacturing Co., has joined the Burns-Hall advertising agency, Milwaukee, where he will specialize on automotive accounts.

John N. Willys will leave Saturday for Palm Beach with his family, but after spending a week with them there will start an extended tour of the southwest, Pacific coast and mountain states which will cover about four weeks.

Herman A. Zannoth, who has been in the employ of the Cadillac Motor Car Co. for the last nineteen years, has been appointed plant engineer for the new Cadillac factory in Detroit. Zannoth was previously chief electrician.

C. W. Inches has resigned as purchasing agent of the Northway Motors Corp. Pending announcement of his new business connection, he will be located at 393 Lexington Avenue, New Haven, Conn.

Ralph Leavenworth has returned to the Standard Parts Co., Cleveland, as advertising manager, which position he relinquished some months ago to take up another line of work.

Andrew Scharff has been appointed Chicago branch manager for the Multibestos Co. He formerly was manager of the Minneapolis district for the same company.

C. H. Ritter has been elected treasurer and **E. N. D'Ancona** secretary of the Yellow Cab Co., Inc.

Report Made by British on Alcohol Manufacture

WASHINGTON, Feb. 1—The disappointing general conclusion that "the prospect is remote of adding materially to the supplies of liquid fuel for internal combustion engines in this country by the manufacture of alcohol from home-grown materials" is made in an interim report prepared by the Department of Scientific and Industrial Research which set up a fuel research board some years ago and was charged with the collection of accurate data from the different parts of the British Empire as to the possibility of producing alcohol in bulk from liquid vegetable materials.

The purpose in mind related to the production and utilization of power alcohol for motor transport.

TO TEST ALCOHOL RULING

CINCINNATI, Feb. 1—Legal action to test the ruling of the Attorney General of Ohio to the effect that denatured alcohol for use in automobile radiators can be sold only by registered pharmacists will be instituted by the Cincinnati automotive organizations.

Bad Roads Retard Car Sales in China

First Automobile Show at Shanghai Arouses Interest in Highway Construction

NEW YORK, Jan. 30—China's first automobile show, which was recently held in Shanghai, was a success not only from a strictly business standpoint, but it served to arouse new interest in the importance of road and highway construction in that Republic. American and European manufacturers were quite liberally represented at the show.

Particularly impressive was the number of European cars exhibited. The show emphasized the increasing competition American manufacturers of both large and small-sized cars must meet in the Orient in the future if they are to hold their own.

While China to-day offers by no means a large market for American automobiles, imports during recent years have shown increases. Some very illuminating statistics were compiled during the show which indicate the increasing use of motor vehicles in China. The imports of 1920, the last full year for which official statistics are available, were nearly treble the value of cars brought in during 1918, and more than thirteen times the value of the imports of motor cars in 1912. Shanghai is shown as the largest buyer of cars in the country.

America in First Place

While statistics are not available showing imports of automobiles into China from all countries by units, an analysis of the statistics showing values throws interesting light on the development of the motor car trade in that country. In 1913, the last pre-war year, the British held first position as a supplier of motor cars to China, with exports valued at Hk. Tls 126,642. (The Haikwan tael, Hk. Tl, is now being quoted on New York exchange around 75 cents to the American dollar). Imports of American automobiles by China during 1913 amounted in value to Hk. Tls. 116,891, and Germany's total was Hk. Tls. 105,590. During that year Canada was the fourth largest supplier of motor cars to China, with an aggregate value of Hk. Tls. 38,444; Belgium came next with Hk. Tls. 38,185, with France following with Hk. Tls. 17,201.

In 1914 America obtained first place among suppliers of motor cars to China and she has consistently held the leadership, the aggregate value of her exports in 1920 being nearly four times more than the aggregate value of British exports to China during the same year.

It is easy to visualize the tremendous possibilities for the marketing of motor cars and trucks in China when there is an adequate highway system. China is a country with an area of 1,890,500 square miles, yet there are only about 7000 miles of roadways fit for motor traffic in this vast territory.

Headlight Group For M.A.M.A. Voted

Manufacturers Will Join Association as Result of Action at Chicago Meeting

CHICAGO, Jan. 30—Manufacturers of headlight devices will come into the Motor and Accessory Manufacturers Association as a group as the result of a decision reached at a meeting held in the La Salle Hotel here to-day. The name of the group and a formal definition of its activities were left to the decision of an executive committee which will meet Friday.

The meeting was presided over by Frederick H. Ford of C. A. Shaler Co., who has been chairman of the temporary organization committee, and Hargrave A. Long, manager of the industrial group department of the M. A. M. A., served as secretary. General Manager M. L. Heminway of the association, addressed the meeting on the advantages of the group plan.

Among the activities discussed which will come within the sphere of the organization are:

Educational work for the benefit of public officials, traffic officers, service stations and the general public in the requirements of headlight construction and adjustment to obtain safer and more satisfactory driving light.

A campaign to show drivers that safe lights are as much to their own interest as to other drivers', regardless of whether headlight regulations are enforced.

Co-operation with such organizations as the Society of Illuminating Engineers, National Safety Council and Motor Vehicle Conference Committee to secure uniform regulations.

Establishing closer personal acquaintance and contact between representatives of the different companies in the headlight devices industry.

Elimination of undesirable and unbusinesslike methods by concerted action.

Standardizing equipment used in headlight construction to obtain greater manufacturing and operating efficiency.

Standardizing and improving packages and containers and methods of shipment to reduce breakages and losses.

Spain's Revised Import Duty Becomes Effective

NEW YORK, Feb. 1—An Associated Press dispatch from Madrid, dated Jan. 31, indicates that the revised import duty on automobiles has gone into effect, the new schedule placing an ad valorem tariff of 20 per cent on cars selling at 20,000 pesetas or less and 25 per cent on higher priced cars. This revision is in line with previous reports to the trade that the Spanish tariff would be revised radically some time in January.

The balance of trade between Spain and the United States swung to Spain for 1921, due to increased buying of Spanish products in the United States, and the result has been that the peseta has swung heavily upward until, on today's quotations, it was between 20 and 25 per cent of par. Numerous exporters in New York have had car orders on their books from Spain for several months, dependent upon the revision of the duty.

FINANCIAL NOTES

Curtiss Aeroplane & Motor Corp. earned a little more than $100,000 in 1921 after various deductions, as compared with a loss of $1,700,000 in 1920. This result was shown on a much smaller volume of business and was due to rigid economy. Readjustment to a peace time basis has been completed, and there is enough business on the books to justify expectations that operations will continue on a fair basis through 1922. No new financing is contemplated by the company, as working capital is ample for the operations contemplated.

Ajax Rubber Co. stockholders have subscribed to practically all the 200,000 shares of new stock, which recently was offered them at $12.50 a share. The income account from Jan. 1 to Sept. 30, 1921, as submitted to the New York Stock Exchange shows operating losses of $2,446,643, with inventory adjustments of $1,157,431 and interest charges of $362,371, making a total loss of $3,966,445.

B. F. Goodrich Co. reports that sales for the year 1921 approximated $87,000,000, but that there was a loss of about $9,000,000 because of further heavy declines in the market value of raw materials. Current assets as of Dec. 31 approximately $51,500,000 and current liabilities only $3,300,000. There was no bank indebtedness, as against bank loans of $29,000,000 Dec. 31, 1920.

The Keystone Tire & Rubber Co. directors have agreed upon a plan to change its capital stock of $10 par shares to shares of no par. The annual financial statement will be issued about the middle of March. Accounts owed the parent company from subsidiaries will be written down to an actual cash value as of Dec. 31.

Studebaker Corp. directors have declared the regular quarterly dividend of $1.75 each on the common and preferred stocks. The earnings of the quarter ending with December will be announced at the time the annual report is made, sometime within a month.

The Auto Sales Corp. reports gross earnings of $1,330,700 for 1921, as compared with $1,547,236 in 1920. The surplus after preferred dividends was $96,311, against a deficit of $23,577 in 1920.

Truck Associations Merge to Form National Body

CHICAGO, Feb. 1—The National Association of Motor Truck Sales Managers and National Motor Truck Manufacturers have formed a new organization by merging the two old associations into a national association. The present membership is forty-five and will be limited. Functions of both old associations will be continued in the new organization, which will include all branches of the trade industry. Don Whitaker probably will be manager.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

During the past week there has been a fairly large supply of call funds and a special feature of the week has been the fact that interior banks were in the market as lenders. The range for call money was 4 per cent to 5 per cent as compared with 3½ per cent to 6 per cent in the previous week. For fixed date funds, 60 days to 6 months, the range was 4½ per cent to 4¾ per cent, the same as in the previous week. The quotation for prime commercial paper also remained unchanged at 4¾ per cent to 5 per cent.

The Federal Reserve statement as of Jan. 25, 1922, reflected a continuation of the movement of liquidation which has been going on almost uninterruptedly for several months. Total reserves increased $7,352,000, of which increased gold holdings constituted $5,556,000. Total earning assets decreased $52,830,000, and total deposits increased $6,098,000. Federal Reserve notes in circulation decreased $45,676,000. The reserve ratio registered an increase from 76 per cent to 77.2 per cent, which is the highest reserve ratio since Sept. 21, 1917.

The New York institution showed an increase of $25,065,000 in total reserves, and a decrease of $25,146,000 in total earning assets. Deposits increased $4,381,000, and Federal Reserve notes in circulation declined $6,710,000. The ratio of total reserves to deposit and Federal Reserve note liabilities combined increased from 87.6 per cent to 89.6 per cent.

Last week the San Francisco institution reduced its rediscount rate on all classes of paper from 5 per cent to 4½ per cent. The Boston, New York, Philadelphia and San Francisco banks now maintain a 4½ per cent rate on all rediscounts.

On Monday of this week, sterling exchanged reached $4.28¼, which is the highest rate since Aug. 15, 1919. Whatever may be the underlying causes of this remarkable rise, there has been a real improvement in England's economic condition within the last six months. One proof of this is to be found in the figures for the United States trade with England. The surplus of exports over imports in our trade for 1921 with England was $608,000,000 less than in 1920, and $1,265,000,000 less than in 1919.

On Jan. 25, an announcement was made of a new offering of United States Treasury short-term notes to the amount of $400,000,000. These notes will bear interest at 4¾ per cent, will be dated Feb. 1, 1922,

35 ENTRIES FOR GRAND PRIX

PARIS, Jan. 20 (*By Mail*)—With 35 entries made at the time of the preliminary closing date, the success of the French Grand Prix appears assured. Of the entries 19 are in the racing class, the remaining in the touring or stock car class.

INDUSTRIAL NOTES

Electric Storage Battery Co. has consolidated its various New York offices at 23-31 West 43rd Street which hereafter will be the headquarters also of the export sales department. Under the new arrangement, F. L. Kellogg, manager of the north Atlantic district, embracing the New York, Boston and Rochester territories, F. F. Sampson, New York branch manager and J. F. Kelly, Jr., export sales manager, will be located in the West 43rd Street offices.

Greenfield Tap & Die Corp. reports that for the second successive month the volume of incoming orders will show a substantial increase over the same period of a year ago, January, like December, showing a good gain. The developments of the last 60 days are regarded as showing the presence of a positive buying power. The increase in volume has appeared in the export as well as the domestic account.

The American Bosch Magneto Corp. has held a successful convention of distributers from all sections of the country. At the convention the company's engineers exhibited and demonstrated several new Bosch units which will be placed on the market in the near future. These included magnetos, battery ignition parts, starting motors, generators, spark plugs and magneto replacement fittings.

The American Commercial Car Co. of Detroit, manufacturers of Wolverine trucks, which recently purchased the plant of the Southern Valve Car Co. at Knoxville, Tenn., will establish an assembling and manufacturing plant for trucks and truck bodies in that city. It is understood the company proposes to establish a third plant on the Pacific coast.

The Sheldon Axle & Spring Co. of Wilkes-Barre reports that demand for its truck axles was 100 per cent greater in January than in December. Orders for springs for passenger cars and trucks was 500 per cent larger in January than in December, and an extra shift is being added in the spring department.

The Standard Parts Co. has received an order for axles valued at $1,000,000 from the Wills-Sainte Claire Co. Shipments will begin in March and extend throughout the year. With this order Standard Parts reports that the Eaton axle division will be busy all year.

The Martin-Parry Corp. has leased a part of the plant on Duncan Avenue, St. Louis, formerly occupied by the Union Dairy Co. The lease is for a long term of years. The St. Louis plant will be used for assembling and as a distributing base for the south and west.

The Erie Motor Truck Co. of Erie, Pa., at its annual meeting elected E. D. Loose secretary and a director to succeed H. C. Liebeau. Harry Wagner was elected treasurer. It is reported that production is now on a basis of five trucks for twelve days.

White Motor Co. reports that orders received in the final quarter of 1921 showed a 37 per cent gain over the same quarter of 1920, and a 25 per cent gain over the third quarter of 1921. Sales in 1921 were 55 per cent of the 1920 business.

The Batavia Auto Products Co., manufacturers of the Batavia generator, a device for vaporizing low grade fuel, has assigned all territory west of Buffalo to Lonney & Carmichael of Detroit.

Bassic Co. representatives held a four-days' convention at the Drake hotel in Chicago. The convention was devoted to business sessions, at which new sales plans were explained.

The Dominion Asbestos & Rubber Corp. will move its executive offices to 1780 Broadway, New York, but will retain the present store and shipping offices at 67 Murray Street.

Timken Roller Bearing Co., Canton, Ohio, has leased a half floor in the Walker Power Building, which will be occupied as a site for Canadian production.

Kissel Motor Car Co. of Hartford, Wis., reports that it sold five cars at the New York show, nine at the Philadelphia show and six at the Milwaukee show.

National Tire & Rubber Co. at East Palestine, Ohio, has resumed operations with a small force, as the result of orders which have been received.

McKay-Grubb Rubber Co. of Minneapolis, jobbers of automotive supplies, has moved to much larger quarters at 1221 Harmon Place.

Senate Reports Bill for Aeronautic Bureau

WASHINGTON, Jan. 31 — Favorable report was made on the so-called Wadsworth bill from the Commerce Committee of the Senate to-day. The measure provides for the establishment of a bureau of aeronautics in the Department of Commerce and the centralization of all civilian aerial activities in this organization. It has been placed on the Senate calendar and an effort will be made to bring about its enactment at an early date. Considerable opposition exists at the present time to the organization of new agencies but it is expected that sufficient pressure will be exercised to encourage its passage.

A similar bill is now pending in the House, known as the Hicks Bill. Aeronautical organizations are giving support to this measure in an effort to pass the legislation before adjournment.

Chinese Importers Ask More Accessory Stocks

WASHINGTON, Feb. 2—Importers in Tientsin, China, are complaining that there are no distributors of American automobile accessories carrying stocks, especially tires, in China, according to a report received from Consul General Stuart J. Fuller.

The result, it is stated, is that the importers suffer considerable inconvenience and delay in settling difficulties growing out of incomplete deliveries, defective parts, etc. It is declared that any manufacturer who maintains ample stocks at a central distributing point in China and can supply local houses without delay is likely to increase the sale of his products.

RECEIVER FOR DISTRIBUTOR

COLUMBUS, Jan. 31—With liabilities of $187,274, the C. T. Dunkle Motor Corp. has gone into the hands of a receiver. Assets are listed at $100,000. The company distributed Willys-Overlands.

METAL MARKETS

STEEL producers and consumers are fairly well agreed that the next few weeks will usher in a decided improvement in demand. The lethargy which paralyzed the market during January can not continue much longer. In a transition period from a minimum of activity to one in which demand regains more normal proportions there is always danger that the sharp contrast between the two conditions lead to exaggeration of the betterment.

Automotive consumers have been consistent buyers of relatively small tonnages right along but, aside from this source of demand and possibly that for tin plate from container manufacturers, it may be said that the general run of steel consumers failed to give the market any support in January. Orders for a few hundred tons of steel looked quite big in January and, if February brings forth from different sources orders for what are usually looked upon as representative tonnages, 5,000 tons or so, much will undoubtedly be made of this perfectly normal buying.

Prices, on the whole, are plastic. There have been sharp cuts in small products, such as bolts and nuts and chain and concessions are encountered all around, full-finished automobile sheets being still held up as the paragon of steadiness in price. The trade looks for a much broader demand for sheets from the automotive industries in February.

Cold-drawn steel bars are held fairly steady in the Pittsburgh market, thanks to automotive demand, a noteworthy condition when the generally ragged character of the steel bar market is taken into consideration.

On the eve of the reopening of the "Pittsburgh plus" case came reports that one of the United States Steel Corporation's subsidiaries is making sales on a "Cleaveland plus" basis. In the ferroalloy market the leading topic of conversation is a report that a Michigan passenger motor car builder is inquiring for 4,000 lbs. of ferrovanadium but that the order has not yet been placed.

Pig Iron.—Automotive foundries are sounding the market for deferred deliveries but immediate buying is mostly confined to single cars.

Steel.—Skelp and blue-annealed sheet mills are reported to have shaded prices on hot-rolled strip steel to 1.90¢, base Pittsburgh. The market for cold-rolled strip steel is steady at 3.50¢, with producers reporting a fairly satisfactory number of orders which, however, average not more than 100 tons. Alloy steel makers report more inquiries for automotive steels but tonnages involved show that purchasing agents are proceeding with a deal of conservatism.

Aluminum.—Importers are more reserved in their attitude, due to unwillingness on the part of European producers to accept prices below those quoted by them. This is especially true of sheets. Competition between the various importers and the domestic producer continues, however, spirited. The recent advances in foreign exchange, especially in Pound Sterling and Swiss francs are fully reflected in the aluminum situation. Automotive demand is improving daily. Large warehouse stocks of ingots continue, of course, to be a vital market factor.

Copper. — Semi-speculative holders are cutting under producers' quotations. The market is soft.

Calendar

SHOWS

Jan. 28-Feb. 4—Chicago, Automobile Salon, Hotel Drake.

Jan. 28-Feb. 4 — Chicago, National Automobile Show, Coliseum, Auspices of N.A.C.C.

Feb. 6 to 11 — Seventh National Tractor Show and Educational Exposition, Minnesota State Fair Grounds, Minneapolis.

Feb. 6 to 11 — Winnipeg, Can., Automotive Equipment Show, Western Canadian Automotive Association.

FOREIGN SHOWS

Feb. 18-27—Brussels, Belgium, Ninth Exhibition of Agricultural Machines and Implements, Palais de la Cinquantenaire.

March, 1922 — Santiago, Chili, Annual Automobile Show.

April 16—Mexico City, Annual Automobile Show, Auspices of the Automotive Division of the American Chamber of Commerce.

April 22-May 1—Prague, Czecho-Slovakia, Fourteenth International Automobile Exhibit.

May, 1922—Quito, Ecuador, Agricultural Exposition, celebrating Centenary of Ecuador. Automotive Section.

Sept. 1922 — Rio de Janeiro, Brazil, Automobile exhibits in connection with the Brazilian Centenary Associcao Automobilista Brazileria.

CONVENTIONS

May 10-12—Philadelphia, Ninth National Foreign Trade Convention of the National Foreign Trade Council.

June 11-15—Milwaukee, Annual International Convention of the Associated Advertising Clubs of the World.

June 26-July 1—Atlantic City, Twenty-fifth Annual Meeting of the American Society for Testing Materials, Chalfonte-Haddon Hall Hotel.

Sept. 18-23, 1922—Rome, Italy, Second Annual Meeting of the International Chamber of Commerce.

S. A. E. MEETINGS

Detroit, Feb. 24, Mar. 24, April 28, May 26.

Minneapolis, Feb. 8-9—Annual Tractor Meeting.

Irish Free State Offers Sales Field

Strong Liking There for American Goods—Country Is Potentially Rich

LONDON, Jan. 20 (*By Mail*)—Present signs point to the British automobile sales season opening late in step with the late Easter, which usually marks the inauguration of the spring sales season. Just now the two items of interest are relatively opposed. The one concerns the poor reports of the trader's prospects at home among users of automobiles for business, the cause being the high taxation on all scores, and the other factor is the prospects of the trade in Ireland following the setting up of the new Irish Free State.

Ireland Stimulated Motoring

The tone in this aspect is optimistic, for Ireland gave a lead to motoring years before the prejudice against it had subsided in England. The Irish, especially in the south and west, have always had a strong liking for American goods. The number of American cars sold in Ireland, apart from Fords, is in the thousands, so that it is not altogether surprising that a section of the irreconcilable minority has put abroad the suggestion that the Irish Government will tax imported automobiles, but concede a strong preferential rate for Americans.

This idea is discounted here for Irishmen recognize that the volume of the trade of their country with Britain will be greater than will be possible with America for many a year.

Big Development Apparent

The Irish automobile trade, when conditions become normal again, will witness a big development, and it behooves American interests not to lose sight of the fact. Ireland being mainly an agricultural country is also potentially correspondingly rich, a fact which is amply proved by the building up of bank deposits among Irish farmers and shopkeepers since the virtual abolition of the Irish landlord class.

As regards the general outlook of the British automobile trade, it should be added that two factors on the right side have marked the incoming of the year. They are: Stocks of materials are mostly exhausted, which means that much high priced materials have been got rid of though no doubt liabilities attaching to it remain as a debt legacy.

Production costs, including bank terms for financing production, are much lower than at the corresponding period of 1921.

Austin Affairs to Be Reviewed

LONDON, Jan. 20 (*By Mail*)—The financial position and outlook of the Austin Motor Co., Northfield, Birmingham, are to be reviewed by the court in a few days with the object of consolidating the company's finances by a creditor's arrangement.

The plan provides for the settlement of the principal debts, offers a prospect of commanding further funds, and insures the dismissal of the winding up petitions.

The Government has the first claim on assets with a mortgage of £240,000 secured on the north and west works, Northfield, Birmingham.

Heavy Loss Is Shown in Dunlop Rubber Report

NEW YORK, Feb. 1—A cable message from London says:

"The Dunlop Rubber Co.'s official report for the year ending August 31 last discloses a net loss of £8,320,000, which is more than one-half of the company's ordinary share capital. The loss, which is said to be the largest, by far, declared by a British company, is attributed by the directors almost entirely to depreciation in the stocks of raw materials, principally rubber and cotton, which were bought on future contracts. The report says nothing regarding the value of the company's capital asset or its American interests."

The London *Times*, discussing the report of the company, says:

"We imagine now that the English company's affairs are straightened out to a considerable extent, it will be possible to make satisfactory arrangements for the participation of American capital in the American undertaking."

A meeting of the shareholders of the company has been fixed for Feb. 10.

Austria Produces More Light Cars

Readier Market Than for Heavier Product Owing to Tax and Operation Cost

WASHINGTON, Feb. 2 — The Austrian factories have recently devoted more attention than formerly, says Trade Commissioner Upson in a report to the Department of Commerce, to the manufacture of light cars, which find a better market than the heavier cars on account of the progressive tax on automobiles and the constantly increasing cost of operation.

The most powerful passenger cars built in Austria are the Graf and Stift, the 6-cylinder 48.60 horsepower and the 4-cylinder 30 horsepower models. Aside from the models mentioned, all other Austrian-made passenger cars are 4-cylinder, ranging from the Daimler, Puch and Graf and Stift models rate at 19.60 horsepower, through the Fiat and Puch of 15.36 and the Steyr of 13.23 horsepower, down to the Perl, which is rated at 7.46 horsepower and is quoted at 2,800,000 crowns.

All But One Car 4-Cylinder

All Austrian-made motor trucks are 4-cylinder, except the Steyr, which makes a 6-cylinder, 2½-ton model. Other manufacturers are the Fross-Buessing, with a 3-ton model estimated at 8,000,000 crowns and a 5-ton model for about 10,000,000 crowns; the Fiat and Perl both make 4-ton trucks; Graf and Stift put out 5-ton trucks and the Saurer has two models, a 3 to 4-ton truck and a 5 to 6-ton truck.

LINCOLN APPROVAL VACATED

WILMINGTON, DEL., Feb. 2 — The U. S. District Court here has vacated its conditional approval of the order issued in the District Court at Detroit for the sale Saturday of the property of the Lincoln Motor Co.

What effect this action will have on the sale is problematical but it is doubtful it will result in any interference with it.